Treatises on

I. Cottage Building

II. Agricultural Engineering

III. on Quarrying

IV on Foundations.

[illegible]

RUDIMENTARY TREATISE

COTTAGE BUILDING:

OR,

HINTS FOR IMPROVING THE DWELLINGS

OF THE

LABOURING CLASSES.

> My Lords . . . our people . . .
> necessary to make them more comfortable.
>
> [illegible]

BY

C. BRUCE ALLEN, ARCHITECT.

London:
JOHN WEALE,
ARCHITECTURAL LIBRARY, 59, HIGH HOLBORN.
[illegible]

See Wilds treatise on construction
of Cottages.

RUDIMENTARY TREATISE.

COTTAGE BUILDING:

OR,

HINTS FOR IMPROVING THE DWELLINGS

OF THE

LABOURING CLASSES.

"My leading doctrine is, that to make these poor people *better*, it is necessary to make them more *comfortable*."

FELLENBERG, OF HOFWYL.

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1849–50.

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PREFACE.

The Author would wish it to be understood that this little treatise does not profess to give *all* the information, practical or otherwise, necessary to the Cottage Builder,—as indeed no treatise, however extensive, can,—*experience*, as well as *knowledge*, being requisite for the successful *practice* of any art.

It is therefore necessary to remind those who are too apt to conceive that the ability to practise any art follows from their having read, however attentively, a treatise on the subject, that in whatever especially applies to their *own business* or *profession*, they would probably be very unwilling to admit that any one, by merely reading a book or two, could possibly be enabled to accomplish that which they are only qualified to execute after perhaps twenty or thirty years' study and experience.

These remarks, which are applicable to other subjects as well as the one here treated of, are the more necessary at the present time, as several works already before the public on this particular subject, and others that are announced for publication, profess to give *all*

the information necessary to qualify a person to become his own Architect.

The Author hopes, therefore, that the perusal of this work, if it answers no other end, may at least convince any rational person that the knowledge of a profession necessary to its successful practice must be acquired by long study and experience; and that the use of an introductory treatise is not to *completely teach* an art, much less to qualify any one to *practise* it, but to give them that amount of information which shall render them better able to judge of the qualifications of those who have made it their profession.

C. B. A.

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COTTAGES FOR THE LABOURING POOR.

CHAPTER I.

Society is not only disfigured but endangered by the Poverty and Ignorance and Vice of a multitude of its members; and its *security* and *happiness* demand nothing so imperiously as that this wretched mass should be enlightened, elevated, redeemed.

A LATE eminent divine, speaking of the Present Age, says—"The physical sufferings of the Poor are not their chief evils. The great calamity of the Poor is not their Poverty, but the tendency of their privations and of their social rank to degradation of mind. Give them the Christian spirit, and they would find in their lot the chief elements of good:" for example,—The domestic affections may and do grow up among the Poor, and these are to all the chief springs of earthly happiness. Books, too, find their way into every house, however mean; and especially that book which contains more nutriment for the intellect, imagination, and heart, than all others—the Bible: and among the Poor are those who find in that one book more enjoyment, more awakening truth, more lofty and beautiful imagery, and more culture to the whole soul, than thousands of the educated find in their general studies, and vastly more than millions in that superficial transitory litera-

ture which consumes all their reading hours. Even the pleasures of a refined taste are not denied to the Poor, but might be easily opened to them by a wise culture. True, their rooms are not lined with works of Art, but the living beauty of Nature opens on the eyes of all her children; and nothing is wanting to the poor man, in his ordinary walks, but a more spiritual eye to discern a beauty which has never yet been embodied in the most inspired works of sculpture or painting.

But the condition of the Poor is, without doubt, unfriendly to mental culture and progress. Confined to a monotonous routine of daily toil, there can be little to rouse in them either thought or feeling; and the hope of a better lot, which rouses and stirs up in other men so much intense thought and action, is apt too soon to fade from their minds. Their condition, too, exerts a most baneful influence on the domestic affections. A family crowded into a single and narrow apartment, which is at once living-room, kitchen, bed-room, nursery, and often hospital, must, without great firmness and self-respect, be wanting in neatness, order, and comfort. *The want of an orderly and comfortable home is among the chief evils of the Poor.*

Another unhappy influence exerted on the Poor is their living in the sight and in the midst of innumerable comforts and luxuries, which are far above their reach. From this flows their envy and discontent, and, in a measure, their crimes, justified to their own minds by what seems to them the unjust and cruel inequalities of social life.

And from this flows another and fearful trial of the Poor, —that while so much is denied them, there is placed within their reach many sinful and debasing gratifications. The same thirst for enjoyment and excitement which drives the rich and prosperous from their pleasant homes to scenes of novelty and stirring amusement, drives the Poor to where they can forget for a time the wearing realities of life; for in every poor man's neighbourhood there flows a Lethean stream, which first

affords him pleasurable excitement, and then buries him for a while in oblivion of all his humiliations and sorrows.*

The civilization of the present age multiplies gratifications and allurements without awakening proportionate moral powers to withstand them.

These are some of the evils of Poverty,—a condition which offers many and peculiar obstructions to the development of intellect and right feeling. It is for the benevolent and wealthy to help to remove them: the Poor can do but little for themselves without assistance,—and surely, ignorant and sorely tempted as they are, they have solemn claims for aid which they have never yet received.

But what are the means commonly used to relieve the wants and distresses of the Poor? They are the support of Charitable Institutions (whose amount of good must, from their comparative fewness, be limited) and Alms-giving. When these means fail, or when the wealthy find their gifts afford no permanent relief, but only call for a renewal of the gift, the unfortunate sufferer is left to descend to the lowest state of human degradation and dependency,—the Parish Workhouse.

That Christianity should have now been in the world for more than eighteen centuries, and that in the most Christian and highly civilized country of the globe, *one-tenth* part of the population should be unable to provide for their individual existence, is a fearful subject of consideration; and the more so when it is seen that the lower animals are never found in this state, but appear to enjoy existence, each one as far as its powers permit, and to provide for itself in the most perfect way. And the question arises, why have all men been endowed with

* This, the great reason of *intemperance*, founded as it is in the very constitution of human nature, is, as far as the *cause* is concerned, both right and proper: it is the misdirection of noble qualities, and shows that the benevolent efforts of those who are so active in the Temperance Movement can have but a very limited effect till more innocent and legitimate excitement is provided for those who are the objects of their praiseworthy exertions.

faculties so much higher, if a few only of the race are to profit by them? If the creatures of instinct enjoy, as all must see they do, all the happiness of which their nature is susceptible, how much greater should be the happiness of reasonable and accountable beings, even on earth? But the reverse is continually and mournfully seen, and is only to be accounted for by the fact, that the feelings and instincts of men require to be directed by enlightened intellect, and that consequently the present wretched and hopeless state of the greater portion of mankind, even in civilized communities, is the natural punishment ordained by Providence for their continued neglect of the means given them for their improvement and progress.

What a painful thought it is that so much of intellectual and moral worth should exist in a state so degrading and useless,—the Charitable Institution or the Workhouse!—while the wealth of the supporters seems only like the liberality of the monasteries, to increase the evil it is meant to alleviate. But so sacred is nature, that it cannot be trampled on with impunity. The God of all nature could never intend that any bearing his image should live on the charity of their fellow-beings.*

* Among the many and admirable Charities in London, none would seem to have a greater claim on public sympathy and support than that for the distressed needle-women, perhaps the most unfortunate and helpless among all those who depend on others for their daily bread. It would appear that except in the London season, as it is called, they are hardly able, or it should rather be, totally unable, to support themselves; much less are they able to pay the high rents commonly asked, even for a meanly furnished single room, and in too many instances resort to prostitution. This tremendous social evil, no Charity, however munificently supported, can hope to cope with. If the ladies who give employment through the shopkeepers to these unfortunate women, were in each case to give it at once to the sempstress herself, how much happier would her condition become!

Indiscriminate charity, alms-giving, the endowment of charities, bestowing pensions, and the various other modes of the exercise of benevolence, so praiseworthy in their origin and so injurious in their tendency, should give

But if little can be done for the grown-up man, all can be done for the Child; its intellectual and moral worth is lying dead: can the wealthy do nothing for its resurrection? can they not send forth to the hovels of the wretched the Teacher and the Philanthropist to rescue the Child? can there be a greater work than to follow the footsteps of Him who "came to Teach, and to Save that which was lost?"

How much would the number of the Poor be lessened by the erection and endowment of Schools and Seminaries for the Children of the Poor, and by providing efficient teachers and good books! The wealth of a community should be willingly bestowed in the rearing and sending forth such teachers, bearing constantly in mind, that "the Education of the Young is the highest and the most important vocation on earth, and that none but the wise and good should be invited to undertake it."*

place to a more enlightened feeling, by consulting the real and ultimate good of the Poor, and not their temporary relief, or the providing for a few who are fortunate enough to become the recipients of a charitable bounty. The benevolent should exert themselves in helping the Poor to help themselves, by teaching them to obtain a maintenance by industry and frugality, and not to remain contented with the momentary gratification of compassionate feelings.

Such charity, it may truly be said, would bless the giver as well as the receivers, who would be rendered by it not only happy in themselves and grateful to their benefactors, but *valuable* to the community.

* On the subject of Books for the Labouring Poor a great error prevails. It is generally thought that if a man is ignorant, any book, however weak, is good enough for him. On the contrary, it would seem that the greater his ignorance, the more powerful the words and ideas which are to rouse his attention. This is only to be done by rendering as cheap as possible the works of Standard Authors, and perhaps still more by the most powerful minds in the community giving themselves earnestly to the subject of Teaching the Poor. This indeed has been done to a certain extent. Archbishop Whately has published an abridgement of his 'Logic,' 'Early Lessons in Reasoning,' suited to the comprehension of all. Mr. Charles Dickens, who has shown that common life may wear a tragic grandeur, and that the haunts of poverty and crime are sometimes lighted

The Education of the Poor is, without doubt, the first and most important aid that can be rendered them by their richer and more gifted brethren; but there is another means of bettering their condition, second only to mental culture, viz. the providing them with *comfortable homes;*—a permanent home for themselves, and one in which to bring up their children, is the greatest physical want of the Poor. It is the feeling of insecurity, and dread of sudden change, partly consequent on this want, that causes so much discontent among the labouring classes.*

Their present extreme wretchedness in these respects will, it is hoped, make any suggestions acceptable to those who have heart and time and means to devote to the cause of human improvement.

And here it may, perhaps, be as well to advert to a common objection, and one often advanced, to any general or extensive efforts to ameliorate the condition of the great body of the people,—which is the small likelihood of their applying themselves to intellectual or creditable pursuits, were means and leisure found for them. But it should be recollected that the trial has never been fairly made,—that objects calculated

up by the presence and influence of the noblest souls, is publishing and making household words the productions of his gifted mind. This is the true and most effectual way of raising the character of a people—by great, original, and vigorous minds thus diffusing themselves.

* The Legislature might do much towards permanently bettering the condition of the Poor, at least in town, by *prohibiting* the letting of an apartment to a poor family which is insufficiently lighted, which cannot be ventilated or kept dry, and which generally cannot but injure health. This might be readily done by appointing commissioners to look after these matters, to see that all houses inhabited by the Poor are tenantable, well ventilated, light and dry, and have means provided for removing filth. This would be of incalculable benefit to the Poor, and would perhaps do more for them as respects their Habitations, than any thing else that could be thought of, as it would *compel* the landlords to keep in decent repair the wretched houses let out to them, and for which the rents now paid are so exorbitant.

to rouse and interest the intellect and feelings have never been systematically presented to them,—and more than this, it is not till the *physical wants* of man are in part satisfied, that he finds time and opportunity for thought. It is a libel on Creative Wisdom to suppose that having bestowed on him such glorious faculties, and having placed him in a world calculated to afford them scope and exercise, he will be for ever blind to their influence.

But even where no thought of permanently bettering the condition of the Poor is entertained, and no thought of the future has any weight, there will surely be something to startle in the fact, that in every large city there dwells a multitude of human beings, falling or fallen into the extreme of moral degradation and bodily destitution,—living in dark, filthy houses, or crowded together in unventilated rooms or damp cellars, where the outward gloom is a type of the darkened mind, and where the child is trained amidst impure words, idleness, and the fumes of intemperance, and is thence sent forth to wander as a thief or a beggar. And this moral pestilence, it must be borne in mind, is not confined to those who actually live in it, but is continually present to those who imagine themselves far removed from its influence. It is dearly paid for in the support of the prisons, madhouses, hospitals, which every where surround them, and sometimes in the ravages of contagious diseases, which visit all equally,—the rich and the poor, the generous and the selfish.

Mr. Charles Dickens eloquently writes—"O for a good spirit, who would take the housetops off with a more potent and benignant hand than the lame demon in the tale, and show a Christian people what dark shapes issue from amidst their homes, to swell the retinue of the destroying angel as he moves forth among them;—for only one night's view of the pale phantom rising from the scenes of our too long neglect, and from the thick and sullen air, where vice and fever propagate together, raining the tremendous social retributions which are ever pouring down, and ever coming thicker! Bright and

blest the morning that should rise on such a night; for men, delayed no more by stumbling-blocks of their own making, which are but specks of dust upon the path between them and eternity, would then apply themselves like creatures of one common origin, owning one duty to the Father of one family, and tending to one common end,—to make the world a better place."

It may be useful to add further and more practical reasons why the necessities of the Poor, as regards their *Habitations*, should meet with increased attention. It will be found to be not only a good and wise but a necessary subject for serious consideration.

Lord Brougham, speaking of national education, says,—"The efforts of the people are still wanting for the purpose of promoting education; and parliament will render no substantial assistance until the people themselves take the matter in hand with energy and spirit, and the determination to 'do something."

If this be true of the *mental cultivation* of the people, it is not less so of their *physical condition*.

But as the efforts already made to improve the condition of the Labouring Classes of society, as regards their *Habitations*, are of so recent a date, the very great *necessity* for them may perhaps be unknown to many; and by others disregarded, thinking the accounts they hear of the miserable dwellings of the Poor exaggerated. To assist in removing these causes of indifference, the following short extracts are made from various sources, as they show, beyond all question, the present wretched and hopeless state of the Poor in this particular, and the necessity that exists for at least attention to it.

One house in the neighbourhood of Monmouth Street was stated in the 'Times' of September 2, 1833, to be let out to various families, consisting of fifty-four human beings, and as yielding a rent to the landlord of between £90 and £100 per annum. The underground floor, consisting of one

apartment, was occupied by one man, one woman, and five children; the ground floor, two apartments, occupied by two men, two women, and eight children; the first floor, two apartments, two men, three women, and five children; second floor, two apartments, containing three men, four women, and six children; garrets, two rooms, occupied by three men, three women, and six children. Thus it appears that a house (and there are hundreds let in a similar manner) in a densely populated and extremely unhealthy neighbourhood, consisting of nine small rooms, was occupied by no less than eleven men, thirteen women, and thirty children, breathing the air of pestilence; and such is the confined state of the neighbourhood that a breath of air can scarcely enter within its purlieus.

The Rev. W. Quekett, says, that in St. George's in the East there are 2618 houses, of which 1802 are occupied by the Poor. Devonshire and Star streets contain 123 houses, which comprise 492 rooms, in size eight feet high by eight feet square, having on the average three persons in each room. There are 6328 rooms inhabited by separate families.

Now hospitals allow 1000 cubic feet of air for each patient, and the workhouses from 500 to 600, but the quantity, as seen above, obtained by the independent labourer of St. George's in the East, is only 170 cubic feet,—a deficiency which must inevitably engender fatal diseases.

He continues, "I have seen from three to four families, of different sexes and of various ages, living in one small room. They eat, drink, sleep, wash, dress, and undress therein, without curtain or screen of any kind. Every domestic arrangement essential to the preservation of decency and cleanliness is wanting. The atmosphere is of the most fœtid and pestiferous kind, whilst the water in the house butts, preserved for the purposes of drinking as well as of washing, is so foul and offensive that the poor lodgers are driven to seek some of a pure kind at the nearest public house, and are thereby compelled to spend much of their hard earnings in stimulating drinks. There are courts which contain houses

in so dilapidated a state, that the inhabitants, amounting to from sixty to seventy, composed of men, women, grown-up boys and girls and children, are obliged to frequent one public convenience, open to public gaze."

Wretched as is the condition of the Poor in this parish, it is just as bad in the wealthy parish of St. James, as reported by the Rector. The same too may be said of the still more opulent parish of St. George. In a word, the dwellings of the Poor are, with slight variations, equally bad in every parish in the metropolis.

Such is generally, as respects their dwellings, the state of the labouring population in the metropolis. The condition of the great body of the people throughout the empire may be inferred from the following statements.

The Rev. Dr. Gilly, Vicar of Norham, in Northumberland, says in a recent pamphlet,—'The Peasantry of the Border,'— "The general character of the best of the old-fashioned hinds' cottages in this neighbourhood (Norham, on the banks of the Tweed) is bad at the best. They have to bring every thing with them; partitions, window-frames, fixtures of all kinds, grates, and a substitute for ceiling; for they are mere sheds. They have no byre for their cows, no sties, no pumps or wells, nothing to promote cleanliness or comfort. The average size of these sheds is about twenty-four feet by sixteen feet. They are dark and unwholesome. The windows do not open, and many of them are not larger than twenty inches by sixteen inches; and into this space are crowded eight, ten, and even twelve persons. How they lie down to rest, how they sleep, how they can preserve common decency, how unutterable horrors are avoided, is beyond all conception. The case is aggravated when there is a young woman to be lodged in this confined space, who is not a member of the family, but is hired to do the field-work, for which every hind is bound to provide a female. It shocks every feeling of propriety to think that in a room and within such a space as I have been describing, civilized beings should be herding together without a decent

separation of age and sex. So long as the agricultural system, in this district, requires the hind to find room for a fellow-servant of the other sex in his cabin, the least that morality and decency can demand is, that he should have a second apartment, where the unmarried female and those of a tender age should sleep apart from him and his wife."

The agricultural labourers' cottages in Bedfordshire are thus described by a writer in the 'Sanatory Report.'

"If we follow the agricultural labourer into his miserable dwelling, we shall find it consisting of two rooms only. The day-room, in addition to the family, contains the cooking utensils, the washing apparatus, agricultural implements, and dirty clothes; the windows broken, and stuffed full of rags. In the sleeping apartment, the parents and their children, boys and girls, are indiscriminately mixed, and frequently a lodger sleeping in the same and only room: generally no window,—the openings in the half-thatched roof admit light, and expose the family to every vicissitude of the weather: the liability of the children so situated to contagious maladies frequently plunges the family into the greatest misery. The husband, enjoying but little comfort under his own roof, resorts to the beer-shop, neglects the cultivation of his garden, and impoverishes his family. The children are brought up without any regard to decency of behaviour, to habits of foresight or self-restraint; they make indifferent servants. The girls become the mothers of bastards, and return home a burden to their parents or to the parish, and fill the work-house. The boys spend the Christmas week's holiday, and their year's wages, in the beer-shops, and enter upon their new situation in rags. Soon tired of the restraint imposed upon them under the roof of their master, they leave his service before the termination of the year's engagement, seek employment as day labourers, not with a view of improving their condition, but with a desire to receive and spend their earnings weekly in the beer-shop: associating with the worst of characters, they become the worst of labourers, resort to poaching,

commit petty thefts, and add to the county rates by commitments and prosecutions."

The same writer says—"On entering an improved cottage, with a neat and cultivated garden, in which the leisure hours of the husband are pleasantly and profitably employed, it will be found that he has no desire to frequent the beer-shop, or spend his evenings from home: the children are trained to labour, to habits and feelings of independence, and taught to connect happiness with industry, and to shrink from idleness and immorality; the girls make good servants, obtain the confidence of their employers, and get promoted to the best situations."

Another writer in the same Report says—"The cottager feels that he is somewhat raised in the scale of society. He sees his wife and family more comfortable than formerly; he rises in respectability of station, and becomes aware that he has a character to lose. Having acquired these important advantages, he is anxious to retain and improve them. On the other hand, a man who comes home to a poor comfortless hovel after his day's labour, and sees all miserable around him, has his spirits more often depressed than excited by it. He feels, that do his best, he shall be miserable still, and is too apt to fly for a temporary refuge to the ale-house or beer-shop. But give him the means of making himself comfortable by his own industry, and I am convinced, by experience, that in many cases he will avail himself of it."

The late Mr. Loudon says, on this subject, that "The existing race of labourers can only be benefited by the humanity and kindness of those of their employers who are men of wealth. The unhappy and unsettled habits of common British labourers, whether employed in agriculture or in the manufactories, is most deplorable, and every effort should be made to better their condition; and I know of no way in which this can be done so easily, as by arranging so as that every married country labourer may occupy a comfortable cottage and garden." A benevolent and comprehensive wish, and

worthy of the kind-hearted and unselfish man who uttered it.*

These accounts are sufficient to show the existing state of the labouring population throughout the empire, for although they refer only to particular localities, they are taken at random, and the condition of the whole will be found on examination to be equally deplorable. But the evil does not end here,—it is not simply the fact of so many people living in such wretched Habitations, but it is a *deficiency* even of these, that helps to fill the union workhouses, and adds to the burden of supporting the Poor.

It is calculated that in this country *one person in every ten is a pauper.* The population of England and Wales in 1847 was 17,076,000. The number of in-door Poor was 265,057, and the number of out-door Poor 1,456,315, making a total of 1,721,372 Poor, subsisting on charity or the labour of others. According to the 14th Report of the Poor-Law Commissioners, the expense of maintaining the Poor is stated to be £4,367,055, and that £7,147,352 were levied in poor-rates.

Within the last two years, there has been so great an addition to the amount of Poor as to be the subject of very serious alarm; for it appears from the last Report of the Poor-Law Commissioners, that

In 1846 the number of poor amounted to 1,470,133;
In 1848 ,, ,, ,, 1,875,541;

showing an increase of 405,408,—a number equalling the population of New York; that is, the able and industrious portion of the community are compelled to pay more than seven millions yearly to support a million and a half (now

* The author would here acknowledge the great assistance and benefit he has derived from the perusal of Mr. Loudon's work on Cottage Architecture, and express his surprise that no public acknowledgment, not even by the numerous friends of Mr. Loudon, either in the shape of a monument or otherwise, should ever have been made to his great usefulness and his disinterested efforts to improve the condition of the labouring classes.

nearly two millions) of helpless or idle Poor. And to this enormous burden must be added the sums spent by the benevolent in the support of charitable institutions, and in private charity; these evils increasing, it must be remembered, with the increase of the population. By attending to the causes of pauperism, it will be seen how far the Workhouse System is likely to lessen it.

Much diversity of opinion prevails on the causes of pauperism, and the remedies for it, as also on the best means of managing the Poor. Many political economists, of whom the late Dr. Chalmers was the chief, have taught that there should be no legal provision for the indigent; that all compulsory assessments for the Poor are injurious to society; and maintain that private benevolence, if fairly left to itself, is quite adequate to provide for them.* Other men, equally wise and experienced in the world, have taught the very opposite doctrine, and are altogether disbelievers in this alleged power of the principle of benevolence.

A great philosophical writer of the present day thus shows the causes of pauperism.

"The causes of that degree of poverty which amounts to destitution are great *defects* in the *body* or the *mind*, or *both*, of the individuals who fall into this condition.

"The lame, the deaf, and the blind, it is evident, may be poor through bodily defects. But the *most numerous* class of destitute poor is that which springs from intellectual incapacity, not amounting to idiotcy, but occasioning so much

* To show how far the principle of benevolence would be likely to provide for the Poor in the absence of a Poor-Law, it may be sufficient to instance the case of the city of Edinburgh, where, according to Professor Alison, the whole of the charitable institutions are sustained by about fifteen hundred benevolent individuals, many of whom subscribe to them all, while the remaining twenty or thirty thousand of the adult population of the city and suburbs, who are able to bear a part of the burden, never contribute a farthing, and at the same time steadily withstand all appeals for private alms.

mental weakness that the individuals are not capable of maintaining their place in the great struggle of social existence. Persons so constituted often provide for their own wants, although with difficulty, during the vigorous period of their lives, and become helpless and a burden on the community in the wane of life.

"Another cause is ignorance, general mental incapacity for acquiring knowledge, and sometimes the want of knowledge of any business or calling.

"Another cause of pauperism is the habit of indulging in intoxicating liquors. This practice undermines the health of the whole nervous system, through which it operates most injuriously on the mind; indeed, the effects of habitual intoxication are well known.

"The last cause is a great convulsion which occurs every few years in our manufacturing and commercial systems, which by deranging trade, deprives many industrious individuals of employment, casts them on charity for subsistence, breaks down their self-respect and feelings of independence, and ultimately degrades them into helpless pauperism."

General incapacity, bodily and mental, being thus seen to be the chief causes of pauperism, therefore all treatment calculated to weaken the bodily or mental powers of the Poor must have the effect of increasing, or, at any rate, keeping at its present amount, the number of the helpless Poor. But a worse evil than the present state of the adult Poor, and that which tends to perpetuate and increase pauperism, is the treatment to which pauper children are subjected; they are fed on the poorest and cheapest fare, and sometimes an insufficiency of that. Bad feeding in childhood weakens the body and the mind, and consequently diminishes the power of the individuals to provide for themselves, and thus perpetuates the evil.

But the treatment pursued in the workhouses with the destitute Poor, is thought, in the case of the able-bodied and old, to be the surest means of deterring others from falling into a

like state, and becoming idle and a burden to the community; yet in the case of the young, no such motive can have any influence. Economy would seem to be, in both cases, the chief reason of its adoption; and as the experiment may be now said to have been well tested, and the result to be a continually increasing pauperism, some other mode of managing the Poor must in time be thought of. Professor Alison has demonstrated by irrefragable evidence, that the wretched pittances doled out to the Poor are inadequate to their comfortable subsistence, and that a continually increasing pauperism is the actual and inevitable consequence of the deep mental depression and physical degradation in which they habitually exist.

But attention should be given, not only to existing paupers, but, what is of far more importance, to the preventing those persons now earning their subsistence from falling into that state, and more especially to the means of saving another generation from springing up, and thus increasing and perpetuating the evil.

If any plan, therefore, can be devised, to prevent even in a slight degree the *increase* of this wide-spreading evil, it must be worthy of attentive consideration.

One, and perhaps the chief means of accomplishing it, (after a sound moral and practical education, which would enable the people to think for themselves, and to become, consequently, independent of others,) would be the providing the Poor with comfortable Habitations, at a rent commensurate with their means.* The rents being more moderate, the Poor would

* There are but few individuals who cannot provide themselves with food and clothing; *it is the non-payment of rent*, from its high amount and the consequent misery and ruin which inevitably follow, that creates so much distress. The truth of this may be proved by inquiring among the industrious classes, both housekeepers and lodgers, when the *rent* will be found to be the great subject of anxiety.

Instead of the multitude of charitable institutions which exist, and are so liberally supported at the present time, and which, from the narrow sphere of their operations, do comparatively so little good, how much

be able to live better, the public-house would be less frequented (bad living being one of the causes of intemperance), the hospitals and workhouses would be less resorted to, as the sick and helpless would remain with their relatives, which they cannot now do, principally for want of room.

An attempt to lessen the number of the destitute Poor, (and so to decrease the poor-rates,) by providing them with comfortable Habitations, may sound somewhat visionary; but surely it is not expecting too much of human nature, to say that no man, however small his earnings, would suffer an aged parent, or sickly child or other near relative, to become the inhabitant of a workhouse, who had a spare room at home in which to lodge them.

This would, in time, do something to prevent the increase of pauperism, by going to the root of the evil, by making the physical condition of the Poor more comfortable, and by its tendency to ameliorate their whole condition by inducing habits of cleanliness, order, and self-respect.

But a series of objections have been and still are urged by some political economists against the system of building Cottages for the Labouring Poor, and it is of the greatest importance that they should be known, as it is upon the views entertained by the political economist, more than to any efforts that can be made by divines and philanthropists, that the future prospects and condition of the Poor must depend.

Mr. M'Culloch says—"Were cottages, with small pieces of ground attached to each, let at a moderate rent to a few of the most industrious labourers in the best cultivated districts of Great Britain, there can be no doubt that the situation of those individuals would in the first instance be ameliorated. They would acquire these possessions with previously formed habits of industry and economy. When their own farm did not require their exertion, they would find employment on the

better would the funds be employed in providing Habitations for the Labouring Poor, and also for assisting them in times of commercial distress, want of employment, or other causes, in the payment of their rents.

more extensive farms in the vicinity, or leisure time would be found for intellectual or other amusement."

But Mr. M'Culloch, with other political economists, thinks that the good done to the agricultural labourer, as above described, would not be of long duration, and that in course of time he would become disgusted with the life of laborious exertion he had formerly led, and that, having become comparatively independent, and not being under the necessity of constantly employing himself, occasional intervals of relaxation would take place. (The very point which the philanthropist has in all ages sought to bring about, leisure for the people at large for mental cultivation, is here stated to be a great evil.) He goes on to show the probable results of this leisure. "A cottager, however small his possessions, has some produce to sell. This, together with his spare time, leads to a habit of going to market; and 'nothing can be more absurd, (says a Mr. Young, whom he quotes,) than a strong hearty man walking some miles, and losing a day's work, to sell a few eggs or a chicken: such habits, too, are sure to lead to dissipation. The small farmer must have his porter and his gin, as well as the large farmer.' "

He further says, "it is obvious that the beneficial effects observed to follow the first introduction of small farms depend almost entirely on the power of the occupiers to employ themselves at other work, when their labour is not required at home. With a generally extended cottage system this could not be the case: where all farms are small, none would require the labour of extra hands, and having thus no work to do himself and nothing to do for others, he would sink into a state of stupid and sluggish indifference.*

* Why, with a generally extended cottage-system, *all* farms should be small, does not appear; but even if they were, with a piece of ground large enough to be called a farm, it is difficult to conceive how any one man can at any time be idle. But giving the cottager a small plot of ground to cultivate (one-sixth of an acre), is not giving him a *farm* to live by, but a *garden* to assist him to live.

"It should always be borne in mind that, except maimed and impotent persons, there cannot be any Poor in a country that deserve to be relieved, unless the population be *redundant;* for so long as the supply of labour does not exceed the demand, the whole of an industrious part of a community may be employed. An industrious man can never be long without employment from any other cause. It would, therefore, be absurd to introduce a system which should lead to a redundancy of population. A man who gets possession of a cottage finds himself in a position to marry; and the cottager feeling an increase of wealth, at least of security against want, is naturally stimulated to that engagement.

"But the rendering it as difficult as possible for a man, when married, to get a house to live in, is found so conducive to easing the rates, that it universally gives rise to an open war against cottages. How often do gentlemen, who have possessions in a parish, purchase the cottages and raze them to the foundation, that they may never become the nests of beggars' brats. A most intelligent witness, Mr. Hodges, M.P., says, 'I am quite satisfied that the erection of cottages has been a most serious evil throughout the country, and I have, with others, pulled down between twenty-six and thirty cottages, which, had they been left standing, would have been inhabited by young married couples.'

"The Poor-Laws," he continues, "have opposed the most powerful obstacle to the cottage system, or the increase of cottages; and consequently to the increase of the agricultural population. If the population of an estate is unduly augmented, the landlords and occupiers are burdened with the support of all, who from old age, sickness, want of employment, or other cause, might become unable to support themselves: they are unwilling to incur any such responsibility, and are therefore compelled to take measures to diminish the population, by pulling down cottages, and preventing their being rebuilt. The influence of this principle has been powerful."

But Mr. M'Culloch allows "that these evils may in part

be obviated, by making the *owners* of all cottages responsible for their occupants, or, by making the assessments to the Poor proportional to the population on the land, as well as to its value."

It would of course extend this part of the subject too far, to institute a detailed comparison of these two methods of getting rid of the poor. The first has yet, on a comprehensive scale, to be tried. The second does not seem to be very clearly made out.

Mr. M'Culloch says, that "by rendering it as difficult as possible for a man, when married, to get a house to live in, is found to ease the rates;" that is, it gets rid of the Poor,—they leave the locality; but he does not attempt to show how this system would act if universally carried out; he does not say where the poor people go to when the houses are too few or the rents are found too high for them, nor whether another parish is found to suffer by their becoming residents in it, or whether they become migratory, wandering about from place to place, and so equalizing the rates.*

It would be curious and interesting, and might throw some light on the question, to follow the fortunes of the unfortunate inhabitants of the between twenty-six and thirty cottages razed to the ground by the far-sighted Mr. Hodges, M.P.

But it must be left to a fair trial and for others to determine which of these two systems is likely to be most beneficial to the community at large—by their attentively considering the nature and causes of pauperism—by considering how far

* Indeed, all that has been urged against providing the industrious classes with comfortable Habitations (setting aside any political considerations) would seem to amount to this, that the difficulty of obtaining houses to live in, consequent on their scarcity, is so discouraging, that the Poor remain in a state of single blessedness rather than incur the risk of passing their lives in so much misery. But what has been stated above goes far to prove that they marry and have children under all circumstances, however wretched—as eleven men, thirteen women, and thirty children living in one small house—and even four families in one room.

the forcible removal of a family from one parish into another is likely to decrease their numbers—by considering how far the workhouse system of feeding children and breeding paupers is calculated to prevent their increase—and by considering whether the healthy children of the well-housed and well-fed peasant are so likely to become a burden to the community as the offspring of the wandering and half-starved victim of the 'Hodge Policy,' or the still more wretched sons and daughters of the inhabitant of a Pauper Union.

CHAPTER II.

SECTION I.—SITE AND POSITION.

In the erection of a cottage, a chief subject of consideration should be the choice of a *situation*, not only as respects its capability for efficient drainage, dryness, and general healthiness, but also as regards its relative position with other buildings; and, where a number are to be built on an entirely new site, to their being so placed as not to interfere with or injure the effect of the surrounding scenery.

Where possible, the cottage should stand by the side of a public road, as well for the sake of the cheerfulness of the inmates as for the beauty and life it imparts to the road itself, and the consequent pleasure it affords to the passers-by.

The cottage should be so placed that the sun may shine on the most frequently inhabited sides of it throughout the year. It should therefore, in this country, face in the direction of north-east, south-west, north-west, or south-east. The front of it can therefore, only in certain situations, be parallel to the public road; but the preference should be given to the south-east, when practicable; the diagonal line through the main building being a north and south line.*

* The lamentable way in which the beauty and loveliness of the finest landscape may be injured or destroyed by *buildings* and *grounds* is exemplified by the far-famed view from the top of Richmond Hill. What it was when Thomson wrote, it would perhaps be difficult to say; but now—instead of the houses and villas, and the gardens about them, harmonizing with, and forming a part of the general view, to be examined in detail after the eye is satiated with the whole—the eye is first struck with the glaring newness (for they all seem as if they were painted and pointed regularly once every year) of first one and then another of these regularly built boxes, placed in the middle of a large square garden or lawn, and

Every cottage should have a garden attached to it, of not less than one-sixth of an acre, to be cultivated by the cottager; it should be bounded by a low wall or hedge, irregular on plan, so as to interrupt the general view as little as may be by regular forms.*

The cow-house and pigsty (where they exist) must, of course, be within the ground occupied by the cottager, but they should be built as far from the house as possible, in one angle of the ground. No inconvenience is likely to be experienced from

surrounded by a high fence; and the country round being thickly wooded close up to the wall, the formality of the *grounds* is rendered truly distressing.

A landscape made up of a collection of square fields, surrounded by regular hedge-rows and dotted here and there with cubical newly painted boxes and straight roads, may satisfy, as it commonly does, the owners of the several lots, but can never be otherwise than painful to the eye of an artist. But what is called landscape scenery in England is mostly of this description, and appears to be admired on the ground of its cultivation and plenty qualities, perfectly distinct from it, considered as a beautiful object.

If any general rule could be given for the laying out building ground, it would be to avoid every thing usually considered essential,—long rows of houses all of the same height,—semicircular rows, with a tall house at each end, and a taller one in the middle, &c. The ugliness of the common plan will be seen by contrasting the picturesque cities of York or Lincoln with the formal and uninteresting appearance of Bath or Cheltenham; or they may be seen side by side in the old quaint town of Hastings and the modern triumphal-arched town of St. Leonard's. From this cause, London, though the largest, is probably the least picturesque city in Europe. Mr. Disraeli, in his 'Tancred,' has ably contrasted the old part of London with the new, and has pointed out the absence of all interest or character in the modern portions. Strange that he should have been able to see so clearly that which the professors of the art have not only been blind to, but are continually helping to increase.

* If the partition between the cottages be formed of evergreens, or other shrubs, they should not be cut architecturally, as has been sometimes recommended for the purpose of showing the cottager's taste. If the cottager is to show his taste and ingenuity in no better way than cutting a tree into the shape of a church or a goose, he had much better remain idle.

damp, smells, &c., where the construction and management, and especially the drainage, is good. Rabbits and poultry may be kept by the cottager with little trouble or expense, especially where there is a garden.

SECTION II.—DRAINAGE, AND SUPPLY OF WATER.

The complete *drainage* of a cottage is a point of the utmost importance, as upon it mainly depend the health and comfort of its inmates. And not only is it requisite that the drainage be perfect, but it must be as little liable as possible to get out of order, and when disturbed for the purpose of cleaning, should be capable of re-instatement with the materials at first used.

Although a complete system of drainage would seem to have but little to do with cottage building, a general view of the subject is necessary, as the substitution of the liquid manure-tank for the common cesspool is most desirable,—and the more especially, as in cases where a number of cottages are erected, one tank might serve the purpose of the whole.

The most essential points to be attended to in the drainage of buildings generally are the following:

All *main sewers* should be formed with concave bottoms, to allow the water, however small in quantity, passing along with solid matter, to act with the utmost possible effect;* and they should be evenly built, not only that any solid matter may be unobstructed, but that the force of the running water may be as little lessened by friction and distribution as possible. They should have arched tops, and be of sufficient height and width to allow men to pass along to repair or cleanse them.

They should have a *fall* of not less than $1\frac{1}{2}$ inch in every 100 feet in length, and more than this in all cases where the flow of water is variable.

* Common sense and science seem to point to the concave form as the best possible for the bottom of a sewer; but Messrs. Walker, Cubitt, and Brunel, after having walked through London by way of the drains, have discovered that the flat bottom is best.

They should have a constant flow of water through them, or powerful flushes at stated intervals.

Means should be provided for their complete ventilation; that is, fresh air should enter them from a low level, and the heated and foul air should pass away at as high a level as possible.

All *soilage drains* are found to be of sufficient dimensions, and the soil and water find ample room to pass along, in a tube equal in capacity to a cylinder of 6 inches in diameter.

They should have a fall of not less than ½ an inch in every 100 feet, under favourable circumstances; and when the water is likely to be small in quantity, as much as 2 to 3 inches.

They should be made water-tight, that the liquid portions of the soilage may not escape, and leave the solid matters in the drain.

They should have a constant flow of water through them, or water in continuous flushes, to carry the soilage onward, and to prevent any solid matter from being deposited within them.

To prevent the foul air generated in or returning by the drains, the waste-ways should be double-trapped, by a bell-trap at the sink where the waste water enters, and by a well-trap short of the inlet to the drain.

All drains should be so constructed as to admit of being opened for the purpose of cleansing without breaking them, and of the displaced portion being afterwards replaced.

A great defect in the common soilage drains, whether built in brickwork or of earthenware pipes, is, that they have to be broken up whenever they require cleansing. This might be obviated by using drains of the form here represented. The upper tile *a*, in the figure, could at any time be lifted off, and the drain cleared, without the necessity of breaking the drain, or of removing any portion of the earth except that immediately covering it. (Fig. 1.)

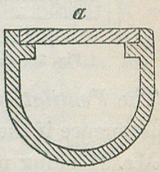


Fig. 1.—Section of drain-tile.

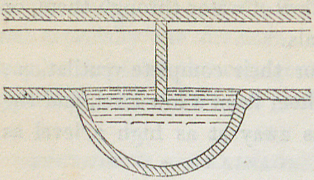


Fig. 2.—Section of drain-trap.

A simple form of trap, applicable to this form of drain, (its transverse section being the same,) and equally effective as regards its capability of being readily cleansed, is shown in the figure. (Fig. 2.)

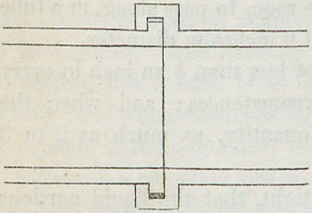


Fig. 3.—Plan of drain-tile.

A form of joint adapted to drain-tiles of this section is here shown: it admits of the cement being poured in (as lead is) in a liquid state, and thereby obviating the common and troublesome mode of fixing. (Fig. 3.)

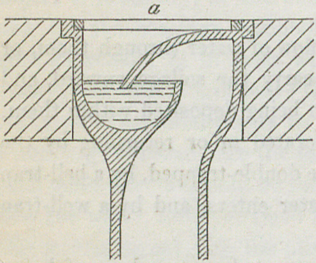


Fig. 4.—Section of drain-trap.

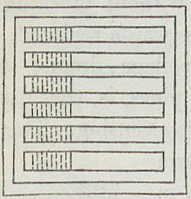


Fig. 5.—Plan.

A section and plan of a drain-trap, to be formed of iron or earthenware, is shown in the adjoining cuts. The plate *a* should not be fixed down, but be left loose, so as to allow of its ready removal, and the cleansing of the trap. It would perhaps be as well to leave the whole of the trap loose, which would allow of its being lifted out, and any obstruction removed. This form of drain-trap is suitable for yards, areas, &c., and, slightly modified, for streets. (Figs. 4 and 5.)

The *Ventilation* of drains would appear to be of the less consequence if their complete cleansing could be insured.

Mr. Hosking proposes to keep clean the main sewers of a town by means of a copious stream or flushes of water, to be

supplied by the water companies from ornamental reservoirs, to be situated in the outskirts of all towns, and which might also be used as swimming-baths, and thus be made to answer two important purposes.

But this plan, although perfectly effective as regards the main sewers, leaves untouched the drains from the houses to the sewers, and it is from these that the inhabitants suffer most. The waste water from the sinks does not seem to be sufficient to cleanse thoroughly these drains; but their cleansing may be effected, and at little expense, by simply shortening, by one or two inches or more, the waste-pipe of the cistern in each case; for as the water comes in from the main faster than it runs off by the waste-pipe, the cistern would continue to fill, till the rate of its coming in (which is always regulated by the ball-cock, and becomes gradually less as the ball rises) became exactly equal to the quantity running off; and this it would of course continue to do till stopped at the main, the quantity of water running off being regulated by the length of the waste-pipe.

By this plan every house-drain might be daily cleansed with water, and kept at a low temperature, at a trifling expense, that is, at merely the cost of the water; and as the quantity of water from each cistern (though small) would in each street amount to a considerable body, it would serve also to cleanse completely the main sewers themselves, without the necessity of any separate apparatus, as proposed above.*

Mr. Hosking also proposes to ventilate each house-drain by

* The author has had no means of testing the efficiency of the above plan. Nothing but experiment can determine the quantity of water necessary to cleanse perfectly a tubular drain of any required diameter; and as the quantity and rapidity of flow would depend on the size and length of the waste-pipe, still further experiments would be necessary to determine these matters. If, in case of a sudden and violent return of the cholera, or from any other cause, it should be found necessary to cleanse the smaller drains as well as the main sewers, without incurring the danger of opening them, this expedient might easily be adopted.

forming a communication from the drain to a chimney-shaft, or by building a shaft for the purpose, and thus conducting the gaseous matters to the upper air. The heated air of the drains, being found to be from thirty to fifty per cent. higher than the external air, would of course ascend; the fresh air being supplied at the mouth of the main sewer.

A number of plans have been proposed, and some adopted, for ventilating the main sewers of a town, but none apparently with perfect success.*

If any mode were adopted of thoroughly cleansing and cooling all the drains and sewers, the ventilation of the main sewers would be sufficient; and this might be readily effected by means of a high shaft or chimney, equal in superficial capacity to the opening of the sewer, a powerful draught being induced by means of a steam-jet or otherwise: the fresh air to be supplied through gratings at the *head* of the sewer, to insure a complete circulation; the gully shoots in this case being of course trapped.

As before remarked, the air of a cottage or other house can never be kept pure unless the *bell* and *water traps* act perfectly, which they seldom or ever do as at present constructed; for the *bells* of the traps in common use for sinks and other places are usually left loose for the convenience of cleaning them, as various matters find their way into the trap, and the escape becomes choked; and unless the bell is immediately replaced after the foreign matter is removed, the trap becomes of course useless. To remedy this defect, the bell is sometimes soldered down; when the trap, after a time, becomes filled up, and the bell is then forcibly removed and laid aside.

* Among the many interesting objects of practical science to be seen in London, there is none perhaps more striking than the mode of ventilating the main sewers; which is effected in the following simple and ingenious manner: open iron gratings are placed at certain distances along the line of the main sewers, so that the gases generated in them are simply conducted through these openings into the street itself. instead of

through a furnace and up a flue into

A simple apparatus for cleansing the traps when the bells are soldered down, has been contrived by Mr. Hosking, and described by him, which would be perfectly effective if its careful preservation and use by servants and others could be relied on.

But the bell-traps in common use may be much improved, and made to answer all the uses required of them, be always certain of action, and yet admit of occasional cleaning, by fixing the bell to the trap by a hinge, as in the figure, with a projecting piece of metal, to prevent its being but partially raised; so that the bell being held up, while the trap is cleaned, by the knob *b* (as indicated by the dotted lines), falls into its place by its own weight, and can consequently never fail: the use of the metal stop *a* is to prevent the bell being thrown back, and left so. It is here shown in section. (Fig. 6.)

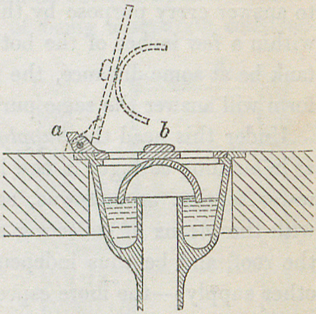


Fig. 6.—Section of bell-trap.

The *sink* may be of wood, lined with lead, of stone, or slate, or perhaps, better than these, of earthenware, which, among other advantages, would allow of the trap being made with it, and forming a part of itself, as in the figure: this would be well suited for cottages, as it could not possibly get out of order, and might be readily cleaned. (Fig. 7.)

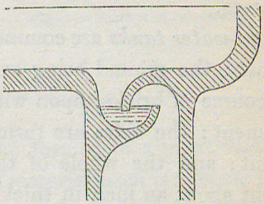


Fig. 7.—Section of bell-trap.

As liquid manure seems from recent experiments to be more valuable than any other, a *liquid manure-tank* should be constructed to every cottage, instead of the ordinary cesspool; and in cases where a number of cottages are built close together, a tank large enough for the whole would be the most economical plan. As they are commonly constructed, the liquid is

drawn from them by means of a well, built close to and as deep as the tank itself; but a better plan would be to construct it as described below for the rain-water filter, with the only difference of there being no upper plate *c*, but merely the earthenware tube with the circular end *b*.

Where a liquid manure-tank is constructed, and a complete water-closet cannot be used, the commoner sort may be made to answer every purpose by the pan-pipe being made to dip to within a few inches of the bottom of the tank; or should the tank be at some distance, the pipe being bent into the syphon form will answer the same purpose.

Under this head the *Supply of Water* may be noticed; for as in building cottages in new localities there can be no regular water service, as in towns, each cottage should be provided with the means of collecting and filtering the rain-water from the roof, and be thus independent, as far as may be, of any other supply,—the more especially as rain-water is the purest of all water.*

It is calculated that the average quantity of water which falls on a square yard of surface in Britain in a year amounts to about 120 gallons, which, for a building containing 100 square yards of roof, gives 12,000 gallons,—an ample quantity for all purposes.

Rain-water tanks are commonly constructed in the following manner: the ground being excavated, the bottom is laid with one course of bricks, upon which two courses of tiles are laid in cement: the sides are formed of two 4-inch brick walls in cement; and the whole of the inside is then rendered with cement about an inch in thickness. The top is either domed over, or covered with a flat stone.

* In places where there is a want of wholesome water, a tank might be constructed large enough to receive the rain-water from the roofs of a number of houses. This would insure a constant supply of soft and pure water for domestic purposes.

The same would apply where there is no complete system of sewerage: a large liquid manure-tank might be constructed.

To filter water into a tank of this kind, a small well or cistern is built close to and touching it: a few inches from the bottom of this well a perforated zinc plate is fitted, upon which the charcoal, &c., is laid, and over it another zinc plate. The rain-water from the roof is conducted to the upper plate, and filters through into the tank.

A modification of the above plan is represented in the drawing, where the tank is shown as covered by a stone slab: the filtering apparatus, instead of being a separate construction, is formed of earthenware, carefully fitted together, *a b*; the circular end, *b*, is perforated with holes, as is also the plate *c*, the space between being filled with the charcoal, &c. This would admit of ready cleaning, as the filter could at any time be lifted out. A bucket is used to draw up the water, which would seem to be preferable to a pump, as it cannot get out of order. The supply-pipe is shown at *d*, and the waste-pipe at *e*. (Fig. 8.)

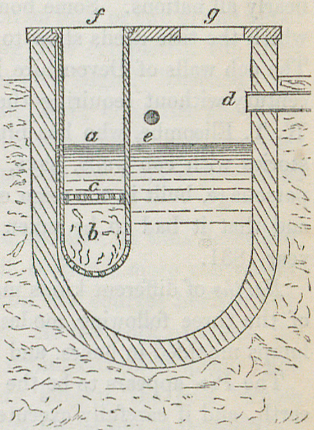


Fig. 8.—Section of rain-water filter.

SECTION III.—WALLS.

The *Walls* of cottages may be formed of a great variety of materials, and the nature of the material used is a fertile source of variety and beauty. As a general principle, it may be remarked that the walls of a cottage should always be built of the materials furnished by the soil or vicinity where it is situated; for in almost every part of the world the *cheapest* substance for building walls is taken from the earth or other substance on which they are to be built.

In all countries where *wood* abounds (this applies especially

to Australia, America, and other thinly peopled countries), it will be found the cheapest, and also a very suitable material for building. The common objection, its want of durability, may be in a great degree remedied by raising footings o masonry or brickwork, or even by forming a platform of dry earth or rubbish, as a basement for the frame-work of the walls; and by having the timber well seasoned.

The employment of different kinds of *earth* for constructing walls, dates from a very early period, and has been used by nearly all nations. Some houses have lately been pulled down which the title-deeds show to have been nearly 200 years old. The cob walls of Devonshire have been known to last above a century without requiring the slightest repair; and the Rev. W. T. Elicombe, who has himself built several houses of two stories with cob walls, says, that he was born in a cob-wall parsonage, built in the reign of Elizabeth, or somewhat earlier, and that it had to be taken down to be rebuilt only in the year 1831.

Earths of different kinds may be formed into walls in either of the three following modes, viz.—in the Pisé manner, by lumps moulded in boxes, and by compressed blocks.

The *Pisé* appears to be the best method of forming walls of earth, and if carefully executed, is one of the warmest, driest, and most durable that can be erected, and at the same time one of the cheapest.

Various modes of forming these walls have been given by different writers: the following appears, however, to contain most of the advantages sought for.

Gravel is the best sort of earth for this kind of walling, and it should be of a loamy nature, with a large proportion of stones. It should be used as dry as possible, no cement being required, as it is held together by the force of cohesion alone.

The foundation upon which Pisé walling is to be erected is formed of stone or brickwork, rising not less than six inches or a foot above the surface of the ground, and about six inches wider than the thickness of the intended wall. It should be

covered with a layer of Roman cement, stone, or tile, to prevent the rising of damp. The foundation being completed, frames formed of planks of any convenient length are fixed by resting them on the edges of the stone or brickwork, on either side; they are held together at the top and bottom by iron bolts, and kept apart at the top by pieces of wood called 'guides,' placed about three feet asunder. The Pisé gravel is then thrown in, about half a bushel at a time, spread evenly, and rammed down till the surface becomes perfectly hard. The work proceeds in this way till the frame is filled to within an inch or two of the upper bolts. A portion of the wall being thus completed, the lower bolts are drawn out and the upper ones slightly loosened: the frame is then raised bodily, till the lower holes rise above the top of the wall; the bolts are then replaced, and, together with those at the top, screwed up, and the work is proceeded with as before.

One course may be raised upon another, as thus described, immediately it is finished; but it is found more convenient, and makes better work, to carry on the courses horizontally, and keep them of an equal height. As the work proceeds, the tops of the walls are kept dry by copings or other means; and when completed to the necessary height, the roof (which should be already framed and ready for fixing) is immediately put on and covered in.

The spaces for the doorways and windows are formed by placing partition boards, fastened to the frame-work by bolts, of the breadth of the wall and height of the frame, on either side of the space to be left vacant; and pieces of timber, two or three inches thick, shaped like truncated wedges, are then inserted, with their bases in the wall itself, and with their smaller sides touching the partition boards: to these timbers the door-posts and window-frames are afterwards fastened. If the building rises above a ground story, sleepers or plates are laid on the inner side of the walls, as in the ordinary manner, for the floor joists to rest on.*

* A great improvement in the Pisé walling, and which would make it

It has not been thought necessary to give drawings or particular descriptions of the frame-work and implements used in the formation of Pisé walling, as they are probably as well known as any other of the implements used in the Builder's art: a slight improvement, however, would be effected in the construction of the frame-work by doing away with the wooden guides, and by altering the form of the bolts.

The above method of forming Pisé walling is different from the mode of building common in Devonshire and the West of England, and known by the name of *cob-building*, as will be seen, and is greatly superior to it, and far more durable.

The substance of which *cob* walls are made is loam or clay mixed with straw and moistened with water; it is formed in frames, in the same way as that above mentioned, but in courses of not more than one foot or one foot and a half in height; it is then left some time to dry and become consolidated before a second course is imposed. The window and door-frames are inserted as the work proceeds, and their respective openings cut out after the work is finished. The strength and solidity of cob walling depends much upon its not being hurried in the process of forming, and, when finished, it must be left some months to dry and settle.

Mud walls, or walls of clay lumps, are thus formed: The clay to be used is first freed from all large stones, and soaked with as much water as it will absorb; it is then well beaten, and a quantity of short old straw added, and the whole well and thoroughly mixed up together. The mixing should be continued by the treading of horses, or otherwise, till the clay becomes thoroughly broken, and of about the consistence of

as durable as stone or brickwork, would be effected by forming the angles and door and window jambs of brick or stone. The solid Pisé itself is found to be, when well and carefully constructed, so hard, that when struck with a hammer, the flints break rather than start from the work. Pisé walls, if thus constructed with stone quoins, doorways, and windows, would be well adapted for Churches and Schools in poor localities. See also Wild's 'Cottages for the Peasantry.'

mortar: it is then put into moulds, 18 inches long, 12 inches wide, and 6 inches deep, without a bottom, and moulded in the same manner as bricks. These lumps are then dried in the sun, and laid in the usual manner with mortar.

As *brickwork* is so general in its application, and as the price only stands in the way of its still more universal adoption, it may be useful to describe the methods usually employed in building *hollow walls* of brick, and thus to economize material.

Silverlock's hollow walls are constructed of bricks set on edge, each course consisting of an alternate series of two bricks placed edgewise, and one laid across; forming a thickness of 9 inches, and a series of cells, each cell 9 inches in the lengthway of the wall, 4 inches broad, and 4½ inches deep. The second course is laid in the same way, but the position of the bricks alternate, or break joint with the first. This method differs from that of Dearne, described below, in being carried up in Flemish instead of English bond. It is represented in section and elevation in the adjoining figures. (Figs. 9 and 10.)

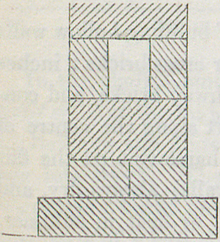


Fig. 9.—Section of Silverlock's hollow wall, 9 inches thick.

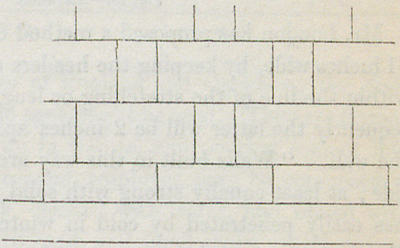


Fig. 10.—Elevation.

Another method of building hollow brick walls is that of Mr. Dearne, in which the lower courses up to the level of the floor are formed in English bond. The next course consists of a series of stretchers on edge on each side, thereby leaving a hollow space throughout the length of the wall: the next course is a row of headers, laid flat; and the same system is

continued throughout. The figures represent a plan, section, and elevation of the wall. (Figs. 11, 12, and 13.)

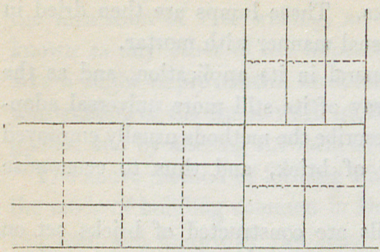


Fig. 11.—Plan of Dearne's hollow brick wall, 9 inches thick.

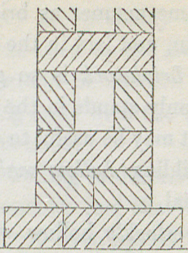


Fig. 12.—Section.

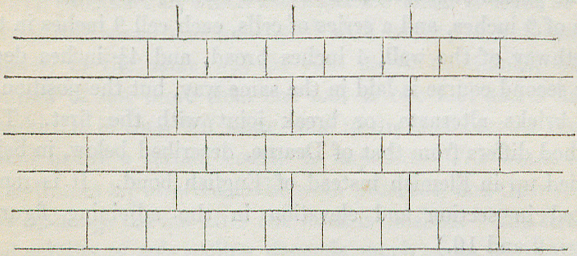


Fig. 13.—Elevation.

Mr. Loudon has proposed a method of building hollow walls 11 inches wide, by keeping the headers or cross bricks 2 inches within the line of the stretching or lengthway bricks, and consequently the latter will be 2 inches apart along the centre of the wall. "Walls built in this way are handsome on the fair side; at least equally strong with solid walls; always dry, and less easily penetrated by cold in winter, or heat in summer. The inner surface, being uneven, is peculiarly favourable for receiving and retaining the plaster." (Fig. 14.)

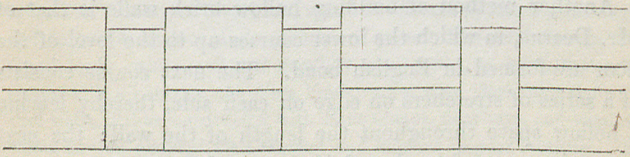


Fig. 14.—Loudon's hollow brick wall, 11 inches thick.

Another mode, 12 inches thick, is represented in the engraving. (Fig. 15.)

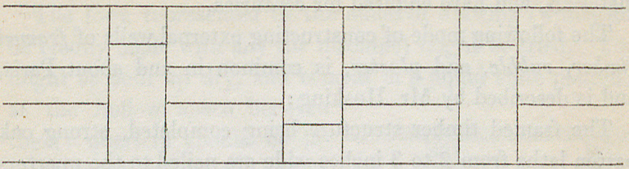


Fig. 15.—Hollow brick wall, 12 inches thick.

The following mode of building a hollow brick wall, 14 inches in thickness, requires but a few additional bricks to that required for a 9-inch solid wall. It is constructed as shown in the figure, which represents one course, the one above that being reversed. (Fig. 16).

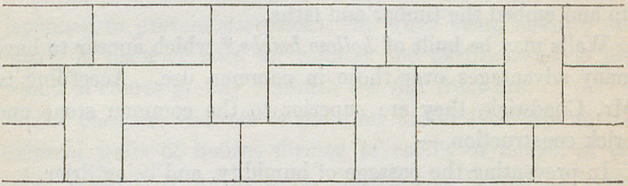


Fig. 16.—Hollow brick wall, 14 inches thick.

In the chalk counties of England and elsewhere, the *flint-built* walls of the middle ages might be used. They are formed by building the flints up in frames, and pouring cement into the interstices. The cement employed may be composed of thoroughly burnt chalk, slacked with water, and mixed with two parts of rough sharp sand, and small sharp gravel-stones; the whole to be mixed up together while dry, and a sufficient quantity of water added to make it into a liquid paste. The foundations must be of brick or stone, and the roof should have a bold projection, to protect the walls from the rain. In this mode of forming walls are included all the small land-stones of a country, so far broken as to incorporate on the cementitious principle of construction.

The Roman circus at Toulouse and the ancient castle at Hastings, besides many other buildings, are built of these materials, and have endured for centuries.

The following mode of constructing external walls of *framed timber, rubble,* and *plaster,* is common in and about Paris, and is described by Mr. Hosking:

The framed timber structure being completed, strong oak batten laths from 2 to 3 inches wide are nailed to the quarters horizontally, at 4, 6, or 8 inches apart, according to the character of the work, and the spaces between are loosely built up with rough stone rubble. A strong mortar is then laid on at both sides at the same time, and pressed completely through from the opposite sides, so that the mortar meets and entirely embeds the stone rubble by filling up all the hollows, and with so much body on the surface as to completely cover up and embed the timber and laths.

Walls may be built of *hollow bricks,** which appear to have many advantages over those in common use. According to Mr. Chadwick, they are superior to the common stone and brick construction,—

In preventing the passage of humidity, and being drier.

In preventing the passage of heat, and being warmer in winter and cooler in summer.

In being a security against fire.

In preventing the passage of sound.

In having less unnecessary material, and being lighter.

In being better dried, and burnt harder and stronger.

In being more cleanly.

In being cheaper.

But however hollow bricks may answer for external walls,

* It has been said that walls formed of hollow bricks are found to harbour insects; but this must be from faulty construction, as there seems no reason why a hollow wall of burnt clay should do so more than a hollow partition of timber and plaster.

It has been proposed to build the external walls of cottages and small houses as thin as 4½ inches with hollow bricks: this is absurd, as no

there can be no doubt of their applicability for inner partitions.

The form represented in the annexed drawing (which may be readily made with any tile machine) might be tried. They might be built up dry, and cement in a liquid state poured in at the hollow space between them: quarters should be inserted on either side of doorways in angles, and at distances of three or four feet.* (Fig. 17.)

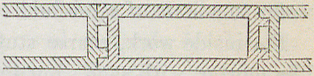


Fig. 17.—Plan of hollow brick partition.

The common quarter partitions, if based on a brick wall, may be rendered nearly fire-proof by brick-nogging them, especially if care be taken to fill in between the joists, over the partitions.

It has lately been proposed to use wire-work (galvanized or japanned to prevent corrosion), the wires being about $\frac{1}{4}$ inch apart, in place of lath, for ceilings and partitions: this plan would of course greatly diminish the risk from fire.

The cheapest and one of the most useful *Coverings* for the external walls of houses formed of earth, or indeed of any other material requiring to be covered, and having projecting eaves, is rough-cast. In the process of executing it, the wall is first pricked up with a coat of lime and hair, on which,

materials, however good or carefully put together, can retain warmth and prevent the passage of sound, if built so slightly.

Mr. Loudon is probably correct in fixing the minimum thickness of external walls in this country, for human habitations, at 18 inches: but indeed nothing less than a series of experiments with walls of different materials and different thicknesses can satisfactorily determine these matters. Some singular and unexpected results would probably arise. A little money judiciously spent in making experiments of this kind would be of very great service.

* Their most convenient size and least thickness must of course be a matter for experiment; and the author would take this opportunity of saying that he has had no means of testing the efficiency of this or of any of the contrivances mentioned: they must be considered, therefore, merely as suggestions.

when tolerably well set, a second coat is laid, as smooth as possible: as fast as the workman finishes this surface, another follows him with the rough-cast, with which he bespatters the fresh plastering, and smoothes it with a brush, so that the whole dries together. The rough-cast is a composition of small gravel, finely washed, mixed with pure lime and water to a state of semi-fluid consistency.

For inside work, coarse stuff, or lime and hair, is prepared like mortar, with sand; but in the mixing, hair of the bullock, obtained from the tanners' yards, is added to it, and distributed over the mass as equally as possible. Mere laying or rendering is, however, the most economical sort of plastering, and does very well for cottages.

The walls may be coloured while the plaster is wet, on the principle of fresco: the colours, by this method, are fresher and more brilliant than by any other, and may be had at a very trifling expense.

But the commoner sorts of paper being now so cheap,—and with greater simplicity of pattern, and by using but one colour, they might be manufactured still cheaper,—the walls of every cottage living-room, at least, should be covered with it, as conducing so much to the cheerfulness and comfort of the inmates.*

* The great beauty capable of being attained in a paper with but two colours (that is, a ground colour and a different one for the ornament) has been pointed out and illustrated by Mr. Pugin, but apparently to little purpose; for the most expensive modern papers consist of a set of unmeaning patterns, or direct imitations of flowers, animals, parts of buildings, &c., in as many colours as the price of the paper admits of, and commonly without the least regard to harmony of arrangement. Those who are unable to produce a beautiful and harmonious effect by the use of *two* colours, are not very likely to succeed by the use of *ten* or a *dozen*,—the difficulty of producing a fine and harmonious effect increasing in a geometrical ratio (so to speak) with every additional colour employed.

SECTION IV.—FLOORS.

The *Floors* of cottages may be formed in a great variety of ways; the principal, and among the most economical, are the following:

Lime-ash floors are formed in several ways, according to the locality. One of the most approved methods is the following: the sand to be used, after being well washed and freed from earth, is mixed with lime ashes, in the proportion of two-thirds sand to one-third lime ashes, both thoroughly mixed together. It is then, after being suffered to remain for two or three days, tempered with water, and laid on the ground, or other surface to be covered, to the depth of about 3 inches. In two or three days it becomes sufficiently hard to bear treading on, and is then beaten all over with a wooden mallet, till it becomes perfectly hard, using at the same time a trowel and a little water to render the surface as smooth as possible. These floors are very durable, having been known to last for a number of years without needing any repair.

Another and very economical mode for ground floors is to lay on a hard and well beaten foundation, clean gravel, sand, lime, and tar, forming a *concrete,* and covering this with an inch and a half of good cement, composed of one part of cement to three parts of sand, carefully floated and trowelled. These floors require to be executed with great care.*

In using plaster or stucco for the upper floors, broad battens, or reeds, are laid on the joists (hoop-iron in lengths to stretch from wall to wall, would perhaps be found better): the upper surface or floor of plaster is then laid and finished as above described, and the ceiling completed between the joists. If the hoop-iron is quite straight and flat, and

* The above modes of forming plaster floors are given from a variety of methods practised in various places: many more might be mentioned, all said to be equally good and lasting; but without a trial there is no way of testing their merits, or of judging which is the best.

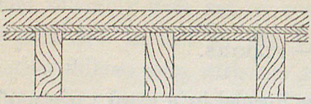


Fig. 18.—Section of plaster floor.

nailed here and there to the joists, close together, no plaster ceiling need be required, the under side being painted. (Fig. 18.)

Asphalte has been much employed of late for the flooring of barns and outbuildings, as well as for pavements, roofs, &c.; but does not appear to have been much used in cottages, for the floors of which it would seem to be admirably adapted, at least for rooms on the ground floor. It is laid down in the following manner: on a dry foundation a layer of gravel or small stones is laid, upon which the asphalte, in a boiling state, is evenly spread to a thickness of about 2 inches, being at the same time carefully pressed down and smoothed: very small stones are then sifted over, and pressed down on it.*

As one principal object in the formation of floors in cottages on the ground story is to insure their dryness,† a method said to be practised in Bengal would seem to be very suitable in places where pottery is cheap. The earth of the room to be

* According to Dr. Ure, an asphalte equal to the natural kind is made by mixing boiled coal tar with powdered chalk or bricks.

† The importance to health of living in a *dry* habitation is thus shown by Captain Murray, R. N., in a letter to a distinguished medical practitioner in Scotland. He says that he succeeded in bringing back to England the whole of his ship's screw without even one sick, after having passed two years among the icebergs of Labrador, and having gone from thence to the coast of Caraccas, and afterwards visiting the whole of the West India Islands and other places,—a severe trial to the constitutions of his men in climates usually fatal to so many Europeans. And this he attributes principally to the *dryness* of his ship, to his having every part of it scrubbed daily with hot sand and holy-stones, and to the employment of Brodie stoves, which were constantly used until every appearance of humidity vanished. He says, "I am quite satisfied that a dry ship will always be a healthy one in any climate." This, of course, must apply equally to houses. To insure dryness, therefore, as much as possible in places where the ground is low and damp, an artificial platform may be formed with dry brick or other rubbish, 18 inches or 2 feet above the level of the ground, and on this the cottage should be built.

floored is made hard and level, and unglazed *earthen pots,* about a foot in height, are then placed with their mouths downwards and close together, over the whole surface: the vacant spaces between the pots are then filled in with pounded charcoal, and over the whole a floor is formed of coarse brick-dust and lime, well worked together. Common flower-pots would answer the purpose, as in the figure, but they would be better if made with a ledge, *a a,* and thereby offer a much firmer resistance to the pressure above than the mere edge of the pot. The space between the pots may of course be filled in with any kind of dry rubbish, (charcoal being expensive,) and the floor formed of lime-ash, as is above described. (Fig. 19.)

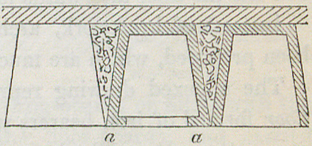


Fig. 19.—Section of a plaster floor.

A still firmer floor, and one needing no cement covering, might be formed by using *hexagonal pots* with a rim, as above mentioned, and a groove and tongue, which would bind the whole together, rendering any cement unnecessary. On a hard foundation the under rim might, perhaps, be dispensed with. (Fig. 20.)

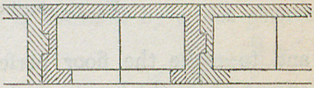


Fig. 20.—Section of a floor formed of hollow pots.

The entrance porch, lobby, kitchen, wash-house, &c., may be paved with *brick on edge;* and in the better sort of cottages, with ornamental *tiles,* set anglewise or square. These tiles may be considered to make the best sort of floors for cottages, as they are hard and nearly indestructible, readily cleaned, and remove all danger from fire. To their use on the ground floor there can be no objection but expense, and this would to a certain extent be removed by their more general use. They might also be readily employed in the upper floors by laying them on longer tiles, as seen in the drawing, and bedding them in cement, in the same way as the common plain tile floors are constructed. If only these latter are used, two

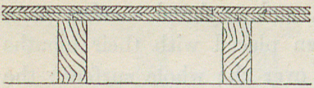


Fig. 21.—Section of tile floor.

courses would be enough for a bearing of two feet from centre to centre of the joists. (Fig 21.)

The upper floors of cottages have lately been executed of arched *brickwork* in mortar. The arches (in one case) were seven feet span, and turned in half a brick, except at the springing and the skew-backs; they rose about one inch in every foot in span; the spandrils were filled in with concrete, and the tile floor afterwards laid with mortar.

Instead of brickwork, arches formed of *hollow pots* have been proposed, which are much lighter.

The annexed drawing represents a section of a *fire-proof floor* formed of iron bearers with brick or hollow pot arches: one or two rods might be necessary to prevent lateral thrust,

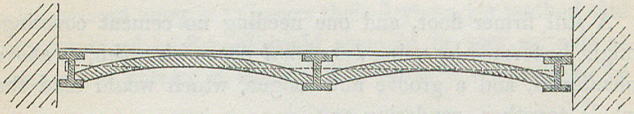


Fig. 22.—Section of fire-proof floor.

and to make the floor perfectly independent of the walls, except where the bearers rest on them. Either a plaster, tile, or wooden floor might be laid on it. (Fig. 22)

The subjoined engraving represents the opening for the fire-place, with the slab for the hearth and trimming joist; and instead of an arch in brickwork, as usual, a series of curved tiles. This it will be seen must answer all the uses which the ordinary brick trimmer is supposed to possess, would be neater, and would require much less labour in the fixing. (Fig. 23.)

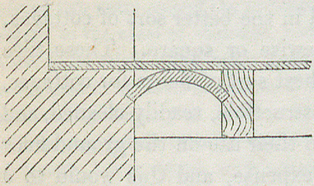


Fig. 23.—Section of tile trimmer.

As the firmness and stability of a brick or stone wall depends so much on its being built without the admission of any

other material, such as wood for plates, &c., and on its having as few points as need be for the support of the floors, a great improvement would be effected by employing girders, as in the figure, from wall to wall, and tenoning the joists into them. This would reduce the supporting points to four in number, and would entirely obviate the necessity of wall-plates. (Figs. 24 and 25.)

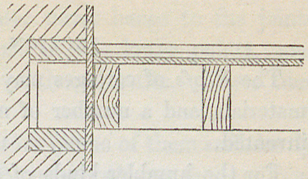


Fig. 24.—Section of girder floor.

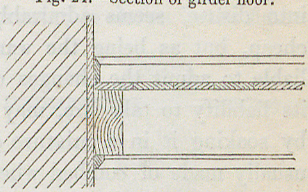


Fig. 25.—Section.

The figures also show the skirting-boards or fillets with the plastering brought down to the floor-boards, and carried through, thereby forming a perfect key, and at the same time leaving no hollow space for harbouring vermin and dust.

In connection with the floors, and fire-proof construction (a most important point in cottage building),* the *Stairs* may be mentioned. As commonly constructed, the hollow space formed by the tread and riser is enclosed by a flat plaster covering or ceiling, having a most unsightly appearance, and rather aiding than preventing their destruction in case of fire.

The engraving shows the bearers of wood, but the tread and riser of earthenware, to be formed in one piece for strength. Stairs thus formed would be fire-proof, and would have a neat appearance. (Figs. 26 and 27.)

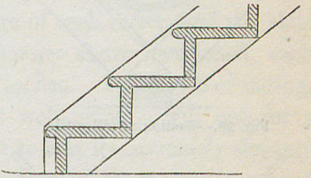


Fig. 26.—Section of stairs formed of tile.

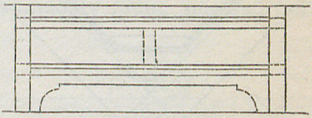


Fig. 27.—Elevation.

* Every cottage ought, as far as possible, to be fire-proof, as, if burnt down, not only the landlord or Fire Insurance Company suffers, but the cottager is probably ruined by losing all his household furniture and working tools.

SECTION V.—ROOFS.

The *Roofs* of cottages may be formed of a great variety of materials, and a number of modes of construction have been invented.

For the humbler kinds of dwellings, *thatch,* though falling into disuse, seems admirably adapted; not only as being cheap, but as being the warmest of all coverings, and less liable to admit the changes of temperature. The objection, its liability to take fire, may be, to a great extent, removed by soaking it in a mixture of alum water and size. It is usually made of combed wheat straw, called reed, consisting of the stiff, unbruised and unbroken stalks which have been carefully separated from the fodder straw by the thrasher. A more durable thatch is formed of the spray of trees, previously well seasoned, hoop chips, and the chips of coppice wood.

The roofs may be covered with the common *pan* or *plain tiles* in the usual manner, the ridges and valleys being also formed in tile. The ridge tiles should always form a straight line; and a great improvement in the valley tiles would be the making them in long lengths, and forming the necessary fall in the thickness of the tile itself, as in the figures: no gutter fillets would be required, and it would be perfectly weather-tight, especially if where a joint occurs it were set in cement, and the joint formed as in figure 3. (Figs. 28 and 29.)

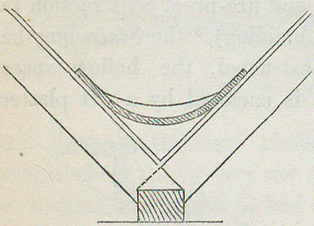


Fig. 28.—Section of valley tile.

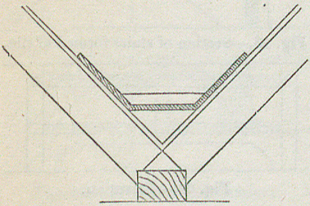


Fig. 29.—Section of valley tile.

The *French roofing tiles,* introduced by Sir John Robison, are square in form, and about 9 inches across, with a raised ledge on two sides. They are laid, with or without mortar,

diagonally, so that the rain-water never hangs to the joints by capillary attraction, but runs to the lower points, and from thence to the flat surface of the next tile. These tiles are lighter than pantiles.

A great variety of *ornamental tiles* (some of them sufficiently fanciful) have of late been manufactured: a better mode of joining them, and one requiring no mortar, is shown in the figure, as the water creeping in under the edge of the upper tile would be effectually stopped by the curved inner rim, which, by its form, would prevent the water from making its way to the roof timbers. (Fig. 30.)

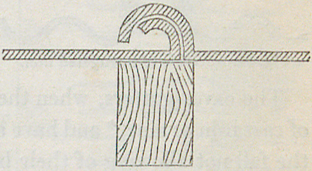


Fig. 30.—Section of roof tile.

A very economical plan of covering a roof with *slate* has lately been introduced, as it only takes half the quantity of slates, requires no battens, and, if large ones are used, a less number of rafters. In this plan of covering a roof, the slates are fixed in the same manner as glass in a skylight, but instead of being inserted in a rebate, a fillet of wood is used, about $1\frac{1}{4}$ inch high and 1 inch broad on the top, and $\frac{3}{4}$ inch broad at the bottom: this slip is nailed down the centre of each rafter, and the slate stopped in with putty in the manner above mentioned, each slate having a lap of from 2 to 3 inches. This mode of slating, if carefully performed and kept well painted, will last for a number of years. One objection to it is its extremely slovenly appearance, as not only the line formed by the putty cannot be kept even, but the paint is commonly found smeared half over the slate. By forming it as in the figure this is remedied: a strong wooden fillet is nailed over both slates, thereby making a perfectly secure joint, as well as showing a neat appearance. The fillet should be well painted before fixing. (Fig. 31.)

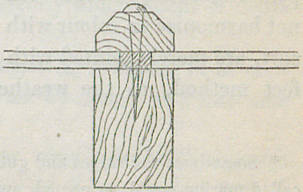


Fig. 31.—Section of slate roof.

Cast-iron roofing has occasionally been employed for cottages, and *corrugated iron* may be used with great advantage, as no rafters are required, and it can be used in long lengths without fear of bending.

As a slight improvement in these roofs, the method here shown might be adopted. The raised portion would not only greatly strengthen it, and allow the iron to be used in longer lengths, but it would have a better appearance. (Fig. 32.)

Fig. 32.—Section of corrugated iron.

The eaves-gutters, when there are any, are commonly formed of cast iron or zinc,* and have a very unsightly appearance, from the fall not allowing of their being fixed parallel to the line of eaves, besides their liability to sag between the supports.

Of late, a wooden gutter has been used, with the fall formed within its own depth, thereby keeping a horizontal line. The joints should be as few as may be, and where they occur should be carefully mitred. These wooden gutters must occasionally be painted. The same form might be used in tile, as in the figure, in as long lengths as possible, and with the joints formed as above described for the valley tiles. (Fig. 33.)

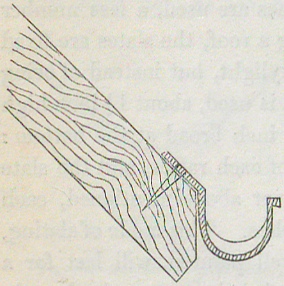


Fig. 33.—Section of tile eaves-gutter.

The angles formed by the chimney-shaft and the roof, as also those formed by the roof and wall, are, in the more expensive houses, covered with lead, which, besides expense, does not harmonize in colour with a tile roof; and in the commoner sort, are merely jointed with mortar or cement,—a very imperfect method, as the weather speedily causes it to crumble

* Sometimes the ridges and gutters of a roof are formed of a substance called marine-metal, so named, apparently, from its wavy appearance and changeable properties when in such situations.

away, and it then becomes necessary to renew it, and is continually a source of trouble and expense.

By using a tile fillet of the shape indicated in the figure, and set in cement, a perfectly secure and water-tight joint would be formed, having a very neat appearance. It is here represented in elevation at *a a,* and the figures *c, d, e,* show different forms of tiles.* (Fig. 34.)

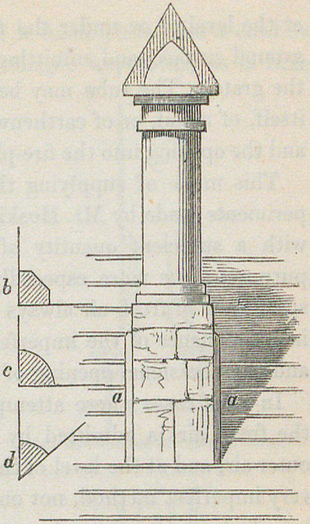


Fig. 34.—Elevation of a chimney-shaft, showing tile angle fillets.

SECTION VI. — VENTILATION AND WARMING.

As economy in materials and construction is absolutely necessary in all that relates to cottage building, any mode of *Ventilation* which could be proposed must be accomplished without an expensive apparatus, and of so simple a nature as to be nearly or quite incapable of derangement.

The prejudice in favour of an open fire being so great, it is imperative in all cases to provide for it; and as it always makes the largest demand on the air of a room, it should be separately supplied, so as to be perfectly independent of doors and windows.

The best way of doing this, at least in cottages, is to connect each fire-place with the outer air by means of a flue-tube

* Tiles of this form, made circular on plan, might be used with advantage for setting the common chimney-pots, instead of the unsightly mass of mortar usually cobbled round them.

at the level of or under the floor, opening out just above the ground surface, and admitting the air behind, or at the side of the grate. The tube may be either formed in the brickwork itself, of metal, or of earthenware. Both the external opening and the opening into the fire-place should be closed by a grating.

This mode of supplying the fire with air would (from experiments made by Mr. Hosking) also supply the room as well with a sufficient quantity of fresh and tempered air for all purposes; the more especially as, according to Dr. Arnott, a sufficiency of fresh air always enters a room by the spaces left in consequence of the imperfect closing of doors and windows, and the occasional opening of the door.

In most cases where attempts are made to ventilate rooms, the fresh air is admitted by an opening connected with the outer air, and at the level of the floor, through the skirting,—a very imperfect method, not only as being dirty, the air collecting dust as it passes, but as creating a draught along the floor in its passage to the opposite opening. By admitting the air through earthenware tubes, at about seven feet above the floor, or just above a person's head, both these sources of annoyance and discomfort would be avoided; the clean earthenware tube would be free from dust, and the cold air would mix with the warm air in the room above the head, and could not therefore be felt as a draught; and as the fire is supplied separately, no down current would be likely to take place.*

The vitiated and heated air in each room may be carried off by the chimney-flue, through an orifice just below the ceiling, fitted with one of Dr. Arnott's chimney-valves or some similar apparatus, or even by a simple opening.†

* In houses of two or more stories, it would be better to draw the air for the supply of the fire, and also for ventilating the rooms, from the staircase, the air in it being warmer than the external atmosphere; and it would at the same time be itself ventilated, means being of course provided in it for the admission of a sufficient quantity of fresh air.

† When it is proposed to let the foul and heated air escape through an aperture close to the ceiling, it is on the supposition that the foul and

Where the draught in the flue is insufficient, and a cowl or other contrivance is needed, a simple apparatus, as is here shown, might answer the purpose. It consists of an inner tube for the passage of the smoke, and an outer one as an air-flue: the space *a a* is open all round, having only enough metal to support the outer tube firmly: the direction of the current of air caused by the wind is represented by the arrows, thereby creating a draught and carrying the smoke up with it.* (Fig. 35.)

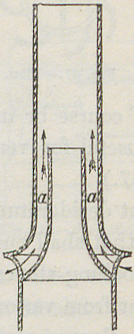


Fig. 35.—Section of chimney-funnel.

Another plan is here shown: it consists of a metal or other tube, inside of which is an Archimedean screw, turned by a wind-vane (shown more clearly on the plan); and so long as the force of the wind is great enough to turn the screw, a continual up-draught or current of air would result. Whether the

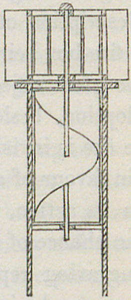


Fig. 36.—Section of chimney-funnel.

heated air *ascends*. The Laws of Nature are usually considered to admit of no exceptions: this is, however, an error. In the neighbourhood, and inside the Model Prison, heated and foul air is found to descend, and accordingly, with admirable wisdom and forethought, the ingenious contriver of that edifice has provided holes close to the floor, through which he supposes the hot air to pass, the colder and fresh air being admitted through apertures near the ceiling! The resources of old age and science are truly wonderful, and at times unfathomable.

* A somewhat similar apparatus is already in use, but it differs from the above in having the external tube of exactly the same height as the inner one. How it is supposed to act cannot be learned: it is called the 'Himalaya funnel,' and operates, it is believed, on those mountains.

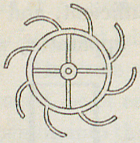


Fig. 37.—Plan.

screw, when not in action—as in perfectly calm weather—would oppose in any inconvenient degree the passage of the smoke, can only be determined by experiment: if it did so, it would of course be inapplicable to smoke-flues, but it might still be useful for ventilating rooms and stair cases.* (Figs. 36 and 37.)

A great desideratum in the cottage is a cheap *cooking-stove*, and one that shall burn inferior fuel. What are usually called cottage cooking-stoves are common in Holland and the Netherlands, but from various causes are little used in England. Of these the Bruges stove appears to be the best adapted both for warming a cottage and for cooking; it consumes the most inferior description of fuel, and that perfectly, as it is a furnace, the fire-box being completely enclosed.

But the great objection to its more general or indeed universal adoption, besides expense, is, that like Dr. Arnott's stove, the fire is invisible; and as the prejudice in England is so great in favour of an open fire, any form of stove, however perfect in its action, where this is not the case, would stand little or no chance of adoption.

The engraving represents a proposed modification of the above stove, combining, to a certain extent, these advantages; it might be used in the cottage kitchen, where the open fire would be less cared for. It is shown in section in the figure, where *a* represents the fire-box; *b*, the space for the passage of smoke; *c*, the chimney-funnel; the holes, *d d*, are for a kettle and saucepan; and when

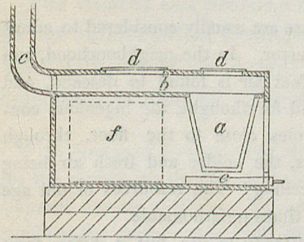


Fig. 38.—Section of cottage cooking-stove.

* The Archimedean screw has been applied for the purpose of ventilation before, but only as turned by machinery.

not in use for these purposes they are covered by iron lids: *e*, is the ash-box, the distance to which it is drawn out regulating the draught, and *f*, the space to be used as an oven. The elevation represents the stove as seen in front, standing on a basement of brickwork; it shows the front of the ash-box and also the door, which could at all times remain open when the stove is not in use for cooking purposes, the fire then burning as in a common grate. (Figs. 38 and 39.)

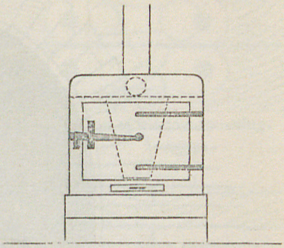


Fig. 39.—Elevation.

This modification of the open and the close stove might, perhaps, in time remove the prejudice that exists against the latter: its perfect action and economy of fuel, when closed, would soon be discovered, and the determination not to use it at all might be removed by opening the door and using it as an open stove.

An economical mode of forming the living-room *fire-place* and *stove* is shown in the annexed drawings. The chimney jambs, arch, and back, are formed of bricks glazed on the outer surface, which would have a very neat and clean appearance. The plan shows the back of the fire-place as circular, with the grate placed as far forward and as nearly in the focus of the reflecting surface as possible. The chimney mouth

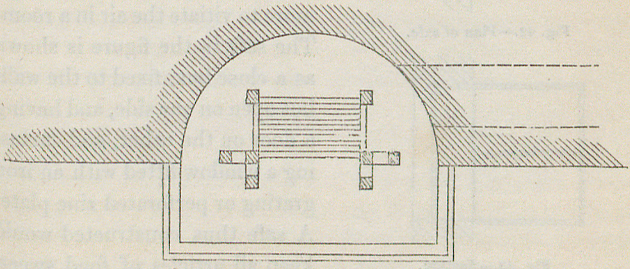


Fig. 40.—Plan of cottage living-room fire-place.

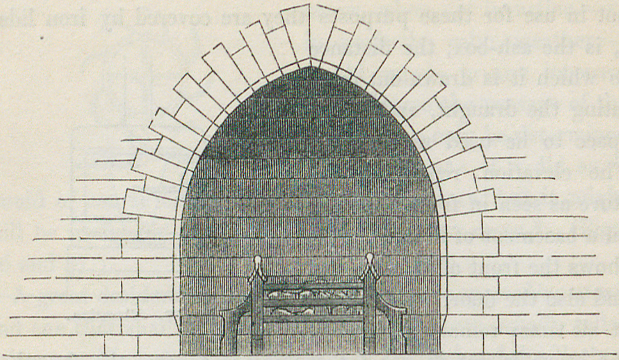


Fig. 41.—Elevation.

should be small, and provided, where the cost will allow of it, with a register flap to regulate the draught. The dotted lines in the plan show the course of the air-flue. The fender may be formed of stone or earthenware. The grate is shown of a simple construction, and may be rendered still more so by forming the supports or sides of brick or tile. (Figs. 40 and 41.)

In connection with ventilation and purity of air, it may be remarked, that a *food-safe* is a most important fixture in a cottage, and should never be omitted. Poor people are apt to leave food lying about, unless there be a place at hand for its reception; and nothing tends more to vitiate the air in a room. The safe in the figure is shown as a close box, fixed to the wall, but open on one side, and having a door on the other, and enclosing a window fitted with an iron grating or perforated zinc plate. A safe thus constructed would keep all articles of food sweet,

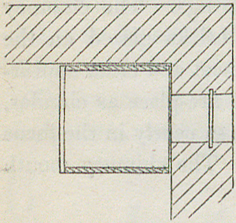


Fig. 42.—Plan of safe.

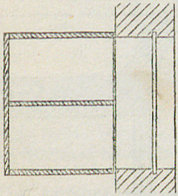


Fig. 43.—Section.

and prevent any smell from entering the room. (Figs. 42 and 43.)

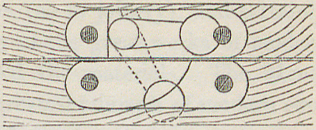


Fig. 44.—Plan of window-fastening.

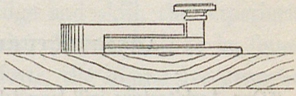


Fig. 45.—Elevation.

In connection too with ventilation, the *door* and *window fastenings* and hinges may be noticed: at present, those used for the commoner sort of houses and cottages become useless after the wear and tear of a month or two; and the reason seems to be, that they are the cheapest and smallest copies of the more expensive ones used in better work. For cottages, things of this kind cannot be too simple. The drawings represent a simple and inexpensive form of window-fastening, the immovable spring and small rusty iron wheel being omitted. (Figs. 44 and 45.)

CHAPTER III.

ARCHITECTURE AS A FINE ART.

"Our Architecture *will* languish, and that in the very dust, until the first principles of common sense be manfully obeyed."—RUSKIN.

IN a book of so limited an extent, and where so much space is necessarily taken up with constructive matters, but little can be said on the subject of Architecture as a *Fine Art*, or on the extent to which it may be applied in cottage buildings. But the Art of *Building*, though all important, is but the means, not the end, of Architectural skill; and it must not be forgotten that the constructive skill of the present age is its grand distinction; and that in no age of the world has construction been so well understood, both theoretically and practically, or the materials used so various, as at the present time.

It is the Art of Design or Architecture as a Fine Art that is wanting: but so little indeed do the *Principles* seem to be understood upon which *Architectural Beauty* depends, that a few words on the subject generally will perhaps be better than on the more restricted application of them to the mere purpose of house building; and this especially, as the Principles which govern the application of an art, and by which it should be judged, do so under every variety of circumstance.

The superiority of Modern over Ancient Art, in all that relates to construction, will be evident by considering that the Egyptians and Greeks seldom, if ever, used (even if they understood) the arch. The Romans had little carpentry, (in the present sense of the word,) brick arches being used where wooden construction would have been much better; and even the Mediæval builders, skilful as they were, had little or

no theoretical knowledge, and but little skill in the more delicate constructive operations (as in joinery), and certainly could not have built very many of the great works of modern times, even had they possessed the materials. The Menai Tubular Bridges, perhaps the greatest triumph of modern constructive art, may be instanced.*

But with constructive knowledge and skill, the superiority of Modern over Ancient Art ends; for where is to be found, amidst modern Architectural efforts, the impressive *grandeur* of the Temples of Egypt? The ruins of Karnak and Luksor show, (independently of association,) that the highest effects which Architecture is able to produce on the mind was attained by that wonderful people; it being recollected that of all the emotions raised by Architecture, *grandeur* and *sublimity* have the highest and most impressive influence.

The great Hall of Karnak, and some of the columned Pronaoi are, without doubt, the most sublime works of Architecture in the world: all travellers have borne their testimony to it,—not, it is true, by endeavouring to show why they are so, but by the unanimous testimony they bear to the overwhelming effect these mighty ruins have had on them,—effects which have been recorded of no other buildings ancient or modern. Indeed, so high was the genius that presided over the con-

* It has been said that Architecture as a *Fine Art* should be studiously excluded from Railway buildings: it may, perhaps, comfort some to know that, in most cases, this has been done; but to others, who think that the Railways offer the finest opportunities afforded by modern wants for architectural display, it must be a matter of painful regret.

A finer subject for a grand composition than the Britannia Bridge can hardly be conceived: the architectural portions will no doubt comfort many—or, if they do not, the lions may be compared with those in the Museum, or with any other objects animate or inanimate. The attached turrets with loopholes of the Conway Bridge are copied from the ancient castle, where their use as a means of defence made them consistent: on a bridge for the passage of a railway train they are of course sheer absurdities. These lost opportunities are the more to be regretted from the extreme simplicity and beauty of the engineering portion of the work.

struction of these wonderful works, that forty centuries have gone by, and still nothing has been produced so great and lasting. They yet remain unrivalled in sublimity.

It would of course be out of place to attempt to show how it is that these effects have been produced only in Egypt, or as to whether it is the *style*, or the *manner of its treatment*, or *both* combined, that produces them; or as to how it is, that in no other country or style these effects have been produced in so high a degree.* Considerations of this kind need for their development an extensive work, but reference to them is necessary even here, as showing that Architecture as a Fine Art, 4000 years ago, was so understood and practised as to produce a higher effect on the mind of the spectator, learned and unlearned, than it is found to do now.†

And again, where is to be found the majestic simplicity and perfect refinement of the Grecian Fanes? The Temple of Minerva seems to unite in the highest degree all the qualities which produce the grand and the beautiful in architecture,—surpassing simplicity of outline, and harmony of

* The Architecture of Egypt is thought by some to be a *transitional style*, and consequently imperfect, and by others, a *rude* and *barbarous* style, and is passed by as being inapplicable to any modern *use*. But sublimity being the highest faculty which Architecture can reach, and the Egyptian having reached it as no other style has, will perhaps one day rescue it from forgetfulness. The 'Angels' Choir' of Lincoln, perhaps the grandest of Pointed interiors, has a less impressive effect on the mind than the Pronaoi of Egypt.

It may be mentioned here, that it is not *colossal size* only which produces the effect of grandeur in a work of art. The two monster houses in Hyde Park are loftier than some of the Egyptian Propylons, and may serve to remove the idea sometimes entertained, that many modern buildings are bad from want of size; a strange notion, for it is difficult to understand how a deformed building can be made good by being *magnified*.

† That it is now applied to a far greater number of *uses* than it ever was before is sometimes brought forward to prove that it is better understood. Architecture may, however, be put to an infinite variety of uses, without its being properly understood or correctly applied in one.

parts, with the most exquisite beauty of detail. Nothing, indeed, seems to have been omitted to perfect this wonderful structure; for not only have all the leading lines been corrected for optical defects, as the entasis of the columns, but the larger detail has undergone the same rigid scrutiny; as (one instance among many others, hitherto unnoticed) the lions' heads which terminate the pediment are turned slightly outwards,—a refinement which could only flow from the finest taste, guided by the most matured judgment. *

And where is to be discovered, amidst the multitude of modern attempts in the Pointed Style, the graceful outline and matchless proportions of that Queen of Pointed Structures, the Abbey Church of Westminster, which, had it been completed by him who laid the foundations and built the choir, would have rivalled the Parthenon as a perfect structure! For it is not only the general proportions of this beautiful Temple, as the height, that is so admirable, but the same evidence of the highest architectural genius may be discovered; some of the leading lines having been similarly treated: as an instance of which, the fourth arch of the choir on either side eastward of the transepts slightly converges, thereby carrying the line of arches round in the most effective and finished manner.

To make the beauty of this arrangement the more evident, it must be considered that the most perfect and graceful way of connecting two long parallel lines, as those formed by the columns and arches of the nave and choir of a cathedral church, is by a curved line (as in Canterbury Cathedral); but this, though perfect on plan, is not so in elevation, as it of course necessitates the arches, triforium arches, and the win-

* Since the recent discoveries of the many optical corrections so carefully made by the builders of the Parthenon, it has been said that perhaps the frigidity of some modern classical designs may be owing to its absence. To those who labour under this idea, it may be said that such refinements can be useful only where the design is in other respects complete. It is the last refinement on a perfect work.

dows above them, being also curved, thereby creating a want of harmony between them and the arches in the choir: added to which, an arch curved on plan is not only weak constructively, but has the painful appearance of being so; the solid mass above setting back from the line of support formed by the supporting columns.* But by the means used, both these imperfections have been avoided, and all the grace and effectiveness of a curved line preserved.

Again, the shafts which run up from the floor to finish under the ribs of the roof are composed of two small ones next the wall, and a larger one in front; the extreme delicacy and beauty of which arrangement is so great as to merit a slight examination, and will serve to show the amount of thought expended on this glorious structure, and to show partly what it is to *design*, or rather to carry out a design.

The object to be attained was, to bring the line formed by the ribs of the roof down to the floor, and so to connect them, and give greater apparent support to the roof. This was best to be accomplished by a column proportioned to the size of the rib; but had it been but a *single* shaft merely, its large size would have struck the eye too violently as a single object. To avoid this, it was necessary to divide it: two were obviously inadmissible; and three, all of the same size, would not have connected themselves with the wall, or rather formed a part of it, as they now do; nor would they have harmonized so well with the more irregular mouldings of the rib: but by using one shaft large and bold enough to bring the line down, and two smaller ones to connect this larger one with the wall, all is accomplished with the most perfect art. And this fine perception of the beautiful is not marred by the string-course, which runs all round the building under the triforium, which would, no

* This appearance of weakness, caused by using arches circular on plan, is sometimes unavoidable, even in the finest works, as is seen in the Round Church at the Temple, but is there of the less consequence as the harmony of the composition is not destroyed, all the arches being curved alike.

doubt, in more vulgar hands have either detailed round all three of the shafts, and thus have cut them in two, or it would have been stopped on either side, and so weakened apparently the slender shafts, by affording them no tie to the walls : but both these objects have been attained by the consummate skill of the Architect, who has stopped the string-course at the smaller columns, but continued it round the larger and outer one, and thus accomplished this difficult problem in the most perfect way. Indeed, this unrivalled structure abounds in these instances of the triumph of genius over the greatest difficulties.

It is this extreme delicacy of perception, amongst other endowments, which constitutes architectural genius, and the insensibility to which draws the impassable line between the efforts of mere talent and the unrivalled works of the great Masters of Architectural Art.

So little, indeed, does it seem to be understood upon what architectural beauty depends, and by what consequently it should be judged, that of the vast number of books that exist on the subject, hardly two are to be found whose authors agree as to the merits or defects of this, or any other, of the celebrated buildings of antiquity, and still less so as regards the qualities and merits of any particular style.

And as to practice, it seems to be admitted that most modern buildings fail to give the pleasure to be derived from an ancient structure;* and this, even in cases where prece-

* One great cause of the inferiority of modern buildings may here be mentioned, viz., the inartistic treatment of the decorative parts. No mere workman can carve a capital or a string of flowers, any more than a mere workman can paint a picture or sculpture a statue. This will be readily seen by comparing the best specimens of carving in any modern building, with the figures, leaves, and flowers so exquisitely chiseled by Grinling Gibbons, or the fine heads by a Royal Academician carved on the keystones at Somerset House. If instead of the time and talents now wasted by so many in fruitless attempts to rival the Grecian Marbles, or the busts of Chantry, (and for whom society cannot, even if it would, find adequate

dent is to be found for every thing; and where the structure itself is old, and merely requires repair, should but a small part be deficient, and an attempt be made to supply it, the most melancholy results are frequently found. Who is there that would not prefer to visit, for the sake of study, (an almost infallible test,) an old church with its pews, galleries, and even monuments, complete, than the same church after having undergone the process of *Restoration?*

As an instance of *designing*, may be mentioned the church of St. Pancras, in the New Road,* the portico of which is a copy of that at Athens attached to the Temple of Erechtheus; but the church itself and spire are designed (put together) from materials taken from the same structure, and others at the same place.†

employment,) they were to make the art of decorative sculpture their especial study, how much would architecture gain by their labours, and how much better would their own position be. What Lorenzo Ghiberti sculptured, and Raphael drew, none surely need be *ashamed* to do likewise.

* This church is instanced not as being particularly bad, but because it is generally thought to be a specimen of *pure Greek*, and as being the only building in London, on a large scale, by which that portion of the public who take any interest in such matters have any opportunity of judging what it is. Its being thought to give an adequate, or even any, idea of what *Greek* Architecture is,—is, however, about as great a delusion as it would be to suppose the French Church, near Oxford Street, a specimen of Middle Pointed, or the Egyptian Hall a specimen of the Egyptian style.

† Various views are entertained as to the nature of *design:* some imagine it to consist in a rigorous adherence to precedent, and are content with copying, as far as circumstances will admit, some old building, but without any attempt to improve either in general form or detail upon the ancient model.

Others, running into the opposite extreme, conceive it to lie in mere novelty, in doing something utterly unlike any thing before attempted, (it is not always they labour in vain;) indeed, as if the mere word novelty was another name for excellence, and necessarily implied it.

And others, again, appear to imagine it to consist in making rough sketches of the building intended for others to carry out, as it is called,

So long as the actual form and proportions of the ancient building was adhered to, all is simply a badly wrought copy,—as the stylobate, the columns, the entablature, and the pediment, which form the portico; but when the precedent could, from the nature of the case, no longer avail, all is confusion and void of meaning,—as the want of purpose in the two recessed columns in the flank elevations: the lower range of windows is merely the upper half of those above; the badly copied Caryatic portico (a defect in the original structure) is here twice repeated in the most awkward manner, they being apparently useless; the semicircular east end (bad in any situation, from the impossibility of combining harmoniously a straight and a curved line) is here singularly misplaced, as the roof, one of the greatest beauties of a Greek Temple, cannot finish over it,—thus destroying that simplicity and unity which regulated all the finer structures of the Greek School. Of the inappropriateness of the ugly spire nothing need be said. It shows, however, what can be done with the Greek Style, and repels the charge of inflexibility commonly brought against it.*

but without any further personal effort; the mere idea being generally considered to be all that is required from those who make the design,—the *working out the idea* forming no part of their business. That putting-together *precedent* (as in most modern churches),—hitting on something novel (as the new Coal Exchange),—and making sketches for others to make practicable (for to go further of course makes it another thing),—that all this is not Architecture—but that carrying out the idea as well as originating it is—may be proved by comparing the Travellers' Club-House, or Bridgewater House, with any one or all of the other Club-Houses, &c. that line Piccadilly and St. James's Street. Such examination and comparison will not only show what *designing* means, but will prove, beyond doubt, that Charles Barry is *the* Architect of this generation, the accomplished successor of Inigo Jones and William Wykeham.

* A common way of criticising a new building, especially if the critic be himself an Architect, is to suppose the way in which he would himself have done it, and by this mental picture to form a comparison and pass his judgment. The true way must of course be to judge of the building as it *is*, and not by supposing what it *might* have been.

Without the finest taste, regulated by correct judgment, the Greek Style, as is here seen, is certainly the last that should be attempted; for the mantle of Phidias is but little likely to descend on any one accidentally apprenticed for a few years to the mere possessor of Stuart's 'Athens,' or Inwood's 'Erechtheum.'

As an instance of a *restoration,* or rather the adding to an old building, the organ screen and stalls in Westminster Abbey may be mentioned.

To harmonize with the grace and airy lightness of this glorious structure, the canopies of the stalls should have been composed of clusters made up of a great number of parts, with the solid portions confined to the base, as at Lincoln or York Minsters; instead of which, those at Winchester appear to have been the model, beautiful in themselves, and admirably adapted to the heavier proportions and coarser detail of that cathedral, but utterly inappropriate in their present position, for which they are manifestly too solid and heavy. What makes their inappropriateness more apparent is, that like the larger monuments, the eye of a stranger is at first so much struck by them as to neglect the building itself; a fatal error, were they ever so fine (appropriate they could not be), as a building, and all things in it, should first make an impression as an entire whole, to be examined in detail afterwards.

A great beauty is noticed by Mr. Hosking, in his admirable Treatise on Architecture, as common to the Egyptian Pronaoi: it is that the dado, standing partly in front of and between the columns, is cut through so as to leave perfectly apparent both their form and height: had it stood completely before the columns, it would have made them appear absurdly short; and had it detailed between them, their diminution would have made the upper portion of the dado and its cornice wider than the base, and would have thereby utterly destroyed all proportion and stability.

This beautiful mode of placing a screen before a series of columns was actually here done (not wittingly, but by the

merest accident); but it appears to have been considered a defect, as that portion of the shaft which cut through the woodwork, and which rendered the form and height of the column apparent, has been pasted over with paper—in imitation of oak!

Moving a number of benches from one church into another, although requiring, as is here seen, some little judgment, can hardly be called a *restoration;* the subject, however, is so important at the present time, that a few words on it (however out of place) may not be found uninteresting. Mr. Ruskin says:

"Neither by the public, nor by those who have the care of public monuments, is the true meaning of the word restoration understood. It means the most *total destruction* which a building can suffer; a destruction out of which *no remnants can be gathered;* a destruction accompanied with a *false description of the thing destroyed.* Do not let us deceive ourselves in this important matter; it is impossible, as impossible as to raise the dead, to restore any thing that has ever been great or beautiful in architecture: that which I have insisted upon as the life of the whole, that spirit which is given only by the hand and eye of the workmen, never can be recalled. Another spirit may be given by another time, and it is then a new building; but the spirit of the dead workman cannot be summoned up and commanded to direct other hands and other thoughts; and as for direct and simple copying, it is palpably impossible. What copying can there be of surfaces that have been worn half an inch down? The whole finish of the work was in the half-inch that is gone: if you attempt to restore that finish, you do it conjecturally; if you copy what is left, granting fidelity to be possible,—and what care or watchfulness or cost can secure it,—how is the new work better than the old? There was yet in the old some life, some mysterious suggestion of what it had been, and of what it had lost, some sweetness in the gentle lines which rain and sun had wrought. There can be none in the brute hardness of the new carving."

It is indeed truly not a little singular, that although a building

(a church for instance) is by nearly all admired for some *extrinsic* merit it may happen to possess,—as some association connected with it,—some monument in it,—or on account of its great age, (and the latter being the most obvious, is also the most common,)—yet all *restorations* are commenced by the complete obliteration of every mark and line which Time has set upon it. The walls, and doors, and windows, and roof, exterior and interior, are made to appear, as much as possible, as they did when first built; the mouldings and carving are re-cut, the surface scraped, and the woodwork varnished, and the interior carefully gutted, and every appearance of age cleaned off; so that, when restored, it has all the appearance of a new building.

Indeed, the perfect restoration of a building would seem to be that in which antiquity is effaced, and the building might be mistaken for a new one. This is not restoration or preservation; but destruction; and not only destruction, but a glaring absurdity. First to admire a building because it looks old, as all pretend to do, and most really do, having no other reason, and then to clean off every sign of age, would seem to more than justify the repetition of Mr. Ruskin's great maxim, that "Until common sense finds its way into architecture, there can be but little hope for it."

And not only are *associations lost*, *age blotted out*, and *beauty destroyed*, but the *colour* which time only can give, and which no art can imitate, is also effaced. And all this is done at the same time that great regret is expressed at the absence of all decorative colour on the outside of buildings in this country, and at the bare and chilling aspect they mostly present under so cold a sky,—the gay and variegated palaces of Venice, and the sunlit churches of Rome, being brought back to the recollection, and mournful comparisons made.

But (even when no restoration is contemplated) no sooner does Nature, by the sunlight, the wind, and the rain, begin to colour the new brick, or the fresh-coloured plaster, or even the new stone, than preparations are commenced for cleaning

it off:—"it looks dirty and wants cleaning;" the brickwork is fresh pointed, the plaster fresh painted, and the stonework freshened, sometimes by *paint*, but mostly by rubbing away the sharp edges of the mouldings, cutting away the ornament, and bringing to an even white surface the rest of the work. It is then said "to look clean and something like."

It is not always, however, that restoration means cleaning off the dirt, for sometimes it means putting it on. Men live by copying the dust of antiquity as well as by sweeping it off. Glass painters are employed to imitate the hues that only centuries of time can give. When a stained glass window is about to be restored, it is not cleaned, but the new glass is covered with dirt to make it look old. The figures are not the best the artist can draw, but the closest copy he can make of old ones, perhaps from the Bayeux tapestry. To restore an old church, is to efface every appearance of age; but to restore a church window, is to imitate the dust which has been scraped off from the church.

And again, should the building be unsuitable for any modern *use*, and consequently stand no chance of a restoration, it is completely neglected and suffered to become surrounded and choked with filth and rubbish, and in most cases (as the Castle of Carisbrook in the Isle of Wight) to become completely enveloped with ivy, scarcely any part of the actual stone being visible; and in this state it is pointed out to visitors as a picturesque ruin. The visitor stares at a vast heap of leaves, but pays for the privilege of seeing a ruin.

This is thought to add to the interest and help the preservation of a ruin; but it would rather appear to be cultivating a formal and ugly heap of green leaves for the purpose of hiding one, and only would seem to require but little *antiquarian* or *architectural knowledge* in those who have the care of such structures, or in their advisers, to perceive it.

It would of course be not only out of place, but impossible, in a work of this nature, to point out in detail the true way in which a restoration should be conducted; but a little may be

attempted by instancing what the restoring mania has done to one or two well-known works; how it has robbed them of all the interest they possessed as things of old time; how it has robbed them of great part of the interest they had as works of ages and men and institutions long past away; and how it has destroyed, in but too many cases, all the merit they had as works of art.

The western aisle of the cloisters at Westminster has been (some little time since) *swept*,—roof, wall, and windows,—with a *birch broom*, for the apparent purpose of cleaning it; and, happily for the mental ease of those who looked for cleanliness underneath, with the most complete success, for all the sharpness of the mouldings, and all the form of the bosses, and all the fine colour which time had given it, are clean gone. The workmen who filled their eyes with the dust of antiquity in this laborious way, at the same time *painted* the head of the doorway opposite *dark lead colour*, to make it, as they said, 'look old!'—Happily they stopped at the doorway leading into the church, which remains as time has left it, and the contrast may be seen between the old doorway painted lead colour to make it look old, and the roof swept to make it look new, and the doorway that waits to be restored.

The north porch of St. Mary Redcliffe, after having been neglected for ages, has just been discovered to be "black and bedizened with dirt," but "beautiful even in its ruins." Time had coloured St. Mary Redcliffe with the hues that time and nature alone can give; some portions of it too had crumbelled away, but still enough was left to show "the fancy (invention) and genius of the old architects," and to display "an imagination and a fire that could not be surpassed" (equalled); "it was designed by men who knew what they were about, and carried out by others with heart and soul," (the corbel heads and foliage re-cut by common masons at so much a dozen within a certain time,) "and the north porch will soon be" (under these likely circumstances) "as beautiful as ever." The north porch of St. Mary Redcliffe is

restored, its associations marred, the evidence of its age swept away, and all is there of the north porch of St. Mary Redcliffe but the "imagination and the fire" which could not be equalled.

The beautiful Norman doorway to the church of the Templars was dark with age; every passing year deepened its colour and added to its interest; it told of the warrior monks who built it, and frowned on them who went to see the effigies of those who had once worshiped there: but the spirit of modern improvement and restoration has swept it away, and entered the church; and the sleeping knights were awakened from their long slumber of six hundred years—to be restored,—to be patched up and polished, and made to look as if just laid down: the hand of time has been removed, and a verger stands near to say to the visitor 'they are old.'

A technical knowledge of antiquity and architecture is surely not required in those who are the guardians of these memorials of the past, to enable them to perceive the inconsistency and absurdity of attempting to *restore* that which has been long since lost, or of marring that which reminds them of the men that are dead, and of the institutions that are past away, or of destroying all evidences of that antiquity they love so well to see. They should endeavour to understand, that to learn antiquity is to learn its spirit, not to bury oneself in its dust, and, least of all, to assist in scraping it off.

True restoration is the taking away every thing foreign to the original idea, as dirt and modern additions, as a common casement from a church window, or the insertion of a quoin-stone where an old one is so much worn as to endanger the structure; but does not include the complete scraping and cleaning a whole tower, for the purpose of matching a new stone, as is now done. A new capital, or a new column, may be added in place of a lost one, but an old and ruined one should never be re-touched. All old work is impressed with a certain spirit,—it is impossible to restore it if lost. Neither the mind nor the hand of the dead artist can ever be recalled.

The very word *restoration* should be unknown in art and cast aside, and *Preservation* be substituted for it. The best restoration is that in which the hand of the restorer is least apparent, and a perfect restoration where it is unseen.

The spirit of the old work being so ill understood, and ignorance of its value and of the principles upon which it is based, would appear to be in part the causes of these various opinions, failures, and modes of destruction.

But to all this it may perhaps be replied, that it is all a matter of *taste,*—that there is no disputing about taste,—that taste is continually changing;—and that no one can be fairly charged with want of taste, or even with bad taste, because he does not happen to think with those who assume to themselves a right to pronounce judgment in all matters of this nature brought before them.

But to this Lord Kaimes, in his 'Elements of Criticism,' has made a fitting reply:—"That there is no disputing about taste, seems to have grown into a proverb. One thing, however, is evident, that if the proverb hold true with respect to taste in matters of art, it must hold equally true with respect to other senses. If the pleasures to be derived from seeing works of art disdain a comparative trial, and reject all criticism, then the pleasure to be derived from the sense of hearing must be equally privileged. At this rate, no one is within the reach of censure who shall prefer the beating of a kettle to the finest concert.

"And if thus all the pleasures of external sense be exempted from criticism, there would seem to be no reason why every one of our pleasures, from whatever source derived, should not be so; and that with respect to the perceptions of sense by which some objects appear agreeable, and some disagreeable, there does not exist such a thing as a good or bad, a right or wrong,—that every one's taste is to himself an ultimate standard, without appeal; and consequently there can be no ground of censure against any one, if such there be, who prefers selfishness to benevolence, or wrong, for its own sake, to right.

"But to ascertain the rules of morality, we appeal not to the common sense of savages, but to that of men in their more perfect state; and we make the same appeal in forming the rules that ought to govern the Fine Arts. In neither can we safely rely on a local or transitory taste, but on that which is the most general and the most lasting among polite nations. For if we have recourse to general opinion and general practice, we are betrayed into endless perplexities. History shows that there is nothing more variable than taste in the Fine Arts."

That there must therefore exist a rule or standard in nature for trying the taste of individuals in the Fine Arts, as well as in Morals, would seem from analogy to be certain; so that the search after it, however fruitless for a time, must eventually be successful.

A great deal has been said and written about a Standard of Taste; and if by it is meant the determining particular objects, or the qualities of those objects which *all* shall regard as beautiful, it must be a vain attempt; as, for instance, one may feel and understand the beauties of a fine painting, but be perfectly deaf to the most exquisite music; another, again, may be alive to the beauties of poetry, but at the same time insensible to the merits of the finest picture.

Taste depends on the suppressing and elevating, the ordering and arranging, of the thoughts and emotions of the mind so as to produce a general harmony of the whole; and it is only practice, reflection, and comparison with the higher standards that give the power successfully to approximate to excellence: and these aids will suffice only when the original constitution of the individual is favourable to it; so that the greater the cultivation of these powers, the higher the authority. It would appear, therefore, that at least *degrees* of beauty may be estimated; and it is in this sense that a scale, if not a standard of taste, may be framed. But it must not be forgotten, that *education* can only *improve* and *refine*, but

can never *create* a feeling for the beautiful either in Nature or Art.*

But the Fine Arts should be the subjects not only of *Taste*, but of *Reason*, and the great object must be to establish Practical Rules for the guidance of those engaged in their cultivation, as well as for that more numerous class who are to judge of them; these Practical Rules being derived from Principles previously established. The utility and necessity of Principles can hardly be exaggerated.† If understood, there would have been fewer books, and of a better kind; for so long as books on the Fine Arts consist merely of the author's individual opinions, there can be no end of them.

A book, for instance, filled with such statements as—'The pyramids have no beauty,'—'the Parthenon is not sublime, but teems with the beautiful,'—'Cologne is as vastly superior to York Minster, as York Minster is to Lincoln,'—without any reason being adduced, or a reference to the Principles which they illustrate, may be extended to an indefinite length, and as many books written as there are authors to write them; but to the public they merely show what the writer's individual opinion is, and no more, and are, in any case, only so far valuable as the taste of the author is known to be above the ordinary standard.

General Laws, apart from their importance, are delightful

* This may be rendered clearer by considering the case of those who attempt to learn music 'without an ear,'—years being often wasted in the fruitless effort.

† While thus urging the importance of *Principles*, care must be taken not to confound them (as they mostly are) with *Rules*. Any violation of an Architectural Principle must take so much from the beauty and perfection of an Architectural Composition: but a Rule, such as, "the height of a column shall be exactly eight of its diameters," may be infringed with impunity, as the column may be seven and three-quarters, or eight and a quarter, or a half, according to the nature of the design. Indeed, the knowing when and how to depart from rules without forgetting them, is one of the great prerogatives of genius; but no genius, however great, can depart from a Law.

from their simplicity, and by reason of the easiness and universality of their application to an infinite variety of cases. The laws of motion are, with the greatest simplicity, boundless in their operations.*

To those, however, who conceive that the attempt to discover Principles would be a mere waste of time, and that, when found out, they would be *practically useless,*—it may be said, that before the discovery of the Law of Gravitation, Astronomy, as a science, did not and could not exist; but now that it is discovered, although so extremely simple, Astronomy is the furthest advanced and the most complete of all the sciences.

And to those who think that the *simplicity* and *obviousness* of First Principles make the attainment of them not worth the trouble it costs, it may be said that the greatest triumph of Philosophy is to refer many and seemingly many various phenomena to one or a very few simple principles; and that the more simple and evident such a principle is, provided it be truly applicable to all the cases in question, the greater is its beauty and scientific value.

Until these Principles therefore shall be discovered, and the mode of their application pointed out, there can be no certain means of judging of the real nature and merit of an Architectural Composition. This is surely a great evil to all, but more especially to the Artist himself, who, however great his merit, has little or no chance of being correctly appreciated. And this incapacity to form a correct judgment, in the absence of guiding principles, is unfortunately not confined to Architecture, as may be evidenced to those who feel any doubt on the subject, by the fact that Michael Angelo, after the lapse of three

* A great number of books have been written, more especially of late, which profess to contain and elucidate the *Principles* of the Fine Arts; but upon examination they prove to be merely the individual *opinions* of the several authors, the so-called principles being found to be applicable only in a limited number of cases; and those the cases chiefly cited by the authors themselves.

hundred years, during which time his works have been looked at and written about, is still admired and copied for his *form;* and that the cartoons of Raphael are *parcelled out* into *picturesque groups* and *Raphaelesque figures,* to be gazed at separately;—the merit of any one of these compositions as a grand whole, and upon which their claims to the admiration of posterity chiefly rest, being disregarded.

But as the knowledge of an Art does not come by intuition, but requires for its attainment a long course of previous study and practice, correct taste or sound judgment is hardly to be expected of those who have not had these advantages; and especially as regards Architecture, it may be safely affirmed that no very great progress can be made by its Professors, and no correct appreciation formed of its merits, until the Laws which regulate Architectural Beauty, and the leading Principles by which to regulate and test an Architectural Composition, shall be discovered.*

Many other causes besides these, however, have combined to retard and misdirect the progress of Art generally; and among them the want of accurate and intelligible definitions of the various words peculiar to the Fine Arts is surely not the

* The necessity for *Reason as a guide to Taste* cannot be too often urged. It would, as is almost obvious, revolutionize Art,—do more for its advancement than all the other helps combined, and would not only be the test of what is done to-day, but would single out from the remains of antiquity, for study and imitation, its great and noble works, and reject the rubbish with which they are too often confounded, and in which they are sometimes buried. Men would not be found falling into ecstasies of wonder and admiration at the Elgin Marbles, and be the next hour equally struck with the mountains of marble (called statues) in St. Paul's or Westminster. They would not be found, as many now are, praising the new Palace at Westminster, and in the same breath, and frequently in the same words, a new-fashioned tea-pot or glaring hearth-rug. Neither would they, who now pass for persons of *taste,* be able to retain the title, who are found to collect in the same apartment an Etruscan vase and a French flower-stand of novel pattern,—a landscape by Turner, and a gaudy print of a royal marriage.

least. Although the nature and limits of this work do not admit of a dissertation on their ambiguity, one or two may be noticed, though a distinct work on the subject would be most useful at the present time.* The words *Invention*, *Originality*, *Simplicity*, *Sublimity*, *Beauty*, among many others, may be instanced:† at present, when used with any definite meaning, they are peculiar to the author, and therefore applicable only in the cases where they are used.

The word 'simplicity,' as applied in the Fine Arts, and as being so important and of such extensive application, should be particularly well defined. One thing is commonly said to be *simpler* than another when it contains *fewer parts*, and it is so far correctly applied; but it must have a far more extensive meaning. Simplicity is one of the grand leading principles which should characterize every Work of Art: without it, it must be comparatively worthless; for it is the characteristic of the purest and noblest.

It is generally allowed by all who have any real pretensions to correct taste, that the simpler a thing is, the more beautiful it is: but if the simplest building (the one containing the *fewest* parts) be the finest, then the Parthenon would have been finer with but six columns in front instead of eight; a window with but two mouldings in the architrave must be finer than another with six; and Raphael's cartoon of 'Christ giving the keys to Peter' must be a finer composition than the 'Death of Ananias,'—the figures and objects being *fewer* in number. Simplicity must regard not only the *number* of parts, but their *form* and *arrangement*.

But of all the causes which have combined to retard the progress of Architecture, the misuse of the term 'picturesque'

* Not a Dictionary of the Fine Arts, but a comprehensive explanation and accurate definition of all words peculiar to Art, and used *adjectively*.

† There is another class of words of recent introduction, but unfortunately unintelligible, as *Æsthetical sentiment! Objective ornamentation! Picturesque leafage!* They are in common and frequent use in the journals professing to criticise Works of Art.

has had, probably, the most wide-spread influence; and though it may seem to many to be quite useless to dwell on the meaning of a word, yet, as Mr. Ruskin truly says,—"probably no word in the language (exclusive of theological expressions) has been the subject of so frequent or so prolonged dispute; yet none remain more vague in their acceptance; and it seems to me to be a matter of no small interest to investigate it." He goes on to say that "a recent critic on Art has gravely advanced the theory, that the essence of the picturesque consists in the expression of 'universal decay;' and it would be curious to trace the steps of any reasoning which on such a theory should account for the picturesqueness of an ass-colt as opposed to a horse-foal." He himself thus defines it: "That peculiar character which separates the picturesque from the characters of subject belonging to the higher walks of Art, may be shortly and decisively expressed. Picturesqueness in this sense is *Parasitical Sublimity*. Two ideas are essential to picturesqueness,—the first, that of sublimity,—for pure beauty is not picturesque at all, and becomes so only as the sublime element mixes with it;—and the second, the subordinate or parasitical position of that sublimity."

One more attempt to define the picturesque (if ever so erroneously), at least as regards Architecture, may surely be pardoned. The term 'picturesque' is commonly and constantly applied to *single* buildings, and even to *geometrical elevations* on paper. But a building can only be picturesque in combination with others, or with a landscape: it cannot *form a picture*, or be the subject of a picture *by itself*.

The Temples at Philæ are picturesque as standing on an island in the middle of the Nile, and thus forming a grand picture;—the Athenian Acropolis is picturesque as consisting of a number of buildings finely grouped;—and Magdalen College at Oxford is picturesque as being a collection of buildings beautifully combined and situated. But in none of these cases can any single building, separated from the rest, be con-

sidered picturesque. The model of the Parthenon in the British Museum, which can be looked at by itself, and without reference to any thing about it,—that is, without other buildings or any thing else to form a landscape,—no one will call picturesque.*

But if confusion arises from the misemployment of words and the want of accurate definitions, it is certain that no less confusion springs from the habit of confounding together the various sources of pleasure to be derived from the contemplation of a Work of Art.

A Work of Art, as an *object of beauty*, should be judged of by the effect it produces, *per se*, on the mind of the spectator, and without reference to its destination, or utility, or other extrinsic quality.†

* When a building (considered by itself) is said to be picturesque, some other words will, upon examination, be found to express what is meant,—that is, when any thing at all is intended beyond a vague and unmeaning admiration,—such as that lately evinced for Stonehenge, when it was seriously proposed to *restore* it. *The restoration of Stonehenge!*

† After what Mr. Ruskin,—whose talents and fine taste cannot be too highly appreciated,—has done for Landscape Painting, it must be a matter of regret that he has so signally failed in Architecture, where his eloquence is as fully needed. He seems to look at a building, not by itself, or for its *intrinsic* merits,—*as all should do when any attempt is made to analyse it for the purpose of pointing out its merits or defects*,—but as grouped with others; that is, with the eye of a painter, or as connected with some traditional associations or religious feelings. But the proper course should be, first to point out the *intrinsic* merits or defects of an architectural work, and then to tell of its uses and associations, and so add to its interest.

In the 'Seven Lamps of Architecture,' Mr. Ruskin proposed to himself a most noble object,—to light and point out the way for others to follow; and he has accordingly named the Styles best suited, as he thinks, for modern imitation, but, unfortunately, without fully explaining their characteristics and capabilities. Something more than mere assertion and individual opinion is required to prove that the Early Middle Pointed is a finer style than that which immediately followed it.

Mr. Pugin has written several books to prove that the Pointed style is that most suited for England; while Mr. Gwilt contends as strenuously

The Parthenon was, no doubt, looked on with feelings of delight by the ancient Greek, as the most beautiful creation of architectural skill; and those feelings must have been greatly heightened by its sacred use, and still more so when, on the occasion of the Great Panathenaic Procession, all the proud associations connected with the sacred origin of his ancient city were made to crowd on the memory of the beholder: and although neither of these latter feelings can operate now to increase the admiration felt for this wonderful structure, still, if perfect, it would be as intrinsically beautiful as it was then. Purpose and association render more vivid and lasting the impression made by a fine Work of Art, but do not alter its intrinsic character.

But still, no building, however perfect, can yield its full measure of delight, unless the eyesight be aided by a feeling of its appropriateness to its destination; as it is one of the perfections of a Work of Art, that it fulfils the purpose for which it is intended; and age and association are perhaps necessary to complete the charm.

The sense of the Beautiful, which pervades all Nature, cannot be too highly prized, nor its cultivation be too earnest; as upon the strength of the original feeling implanted by the Creator, and upon its cultivation, all appreciation and delight not in Art only, but in the grandeur and loveliness of the creation, rest. The whole creation may indeed be said to administer to the sense of beauty; and perhaps one purpose of its being called into existence was to give it scope and exercise. "Beauty," says a great writer, "is an all-pervading presence. It unfolds in the numberless flowers of the spring: it waves in the branches of the trees and the green blades of grass: it haunts the depths of the earth and sea, and gleams out in the hues of the shell and the precious stone. The ocean, the mountains, the clouds, the heavens, the stars, the

for Italian; and the late Mr. Repton, after examining and rejecting all other styles, fixed on the Hindoo as the most appropriate.

rising and setting sun, all overflow with beauty. The universe is its temple."

If the Creator has impressed all Nature with beauty, and his creatures with the sense, when cultivated, universally to perceive it,—it becomes a duty as well as a pleasure to awaken it in those who are insensible to it, and should be the great and leading motive in the Artist's mind.

PLATES.

PLANS, ELEVATIONS, SECTIONS, ETC.

Plate I. Plan of a double cottage. Each cottage shows the least accommodation which should exist for a man and his wife, without children, and contains an entrance lobby, a living-room with a fire-place and two dwarf cupboards, a bed-room, a wash-house with an oven, and a safe, sink, and a small dresser. The privy, fuel store, and dust bin, are at the back, at *a a* (not shown on the plan for want of room).

Plate II. Elevation.

Plate III. Longitudinal Section.

Plate IV. Entrance doorway, window, and chimney-pot, a larger scale.

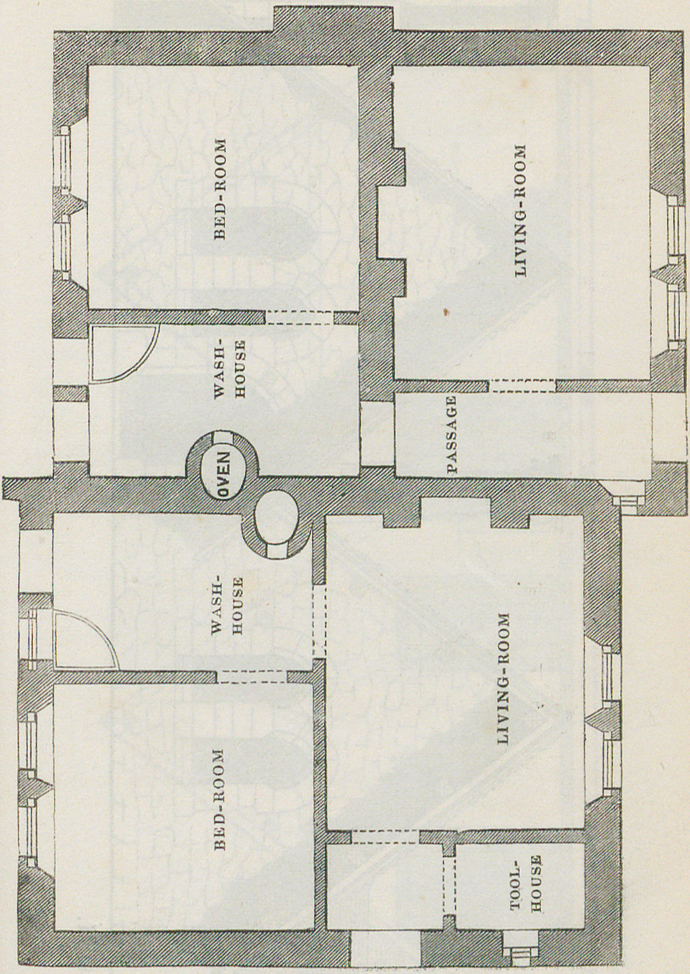

BED-ROOM
LIVING-ROOM
WASH-HOUSE
PASSAGE
OVEN
WASH-HOUSE
LIVING-ROOM
BED-ROOM
TOOL-HOUSE

Plate I

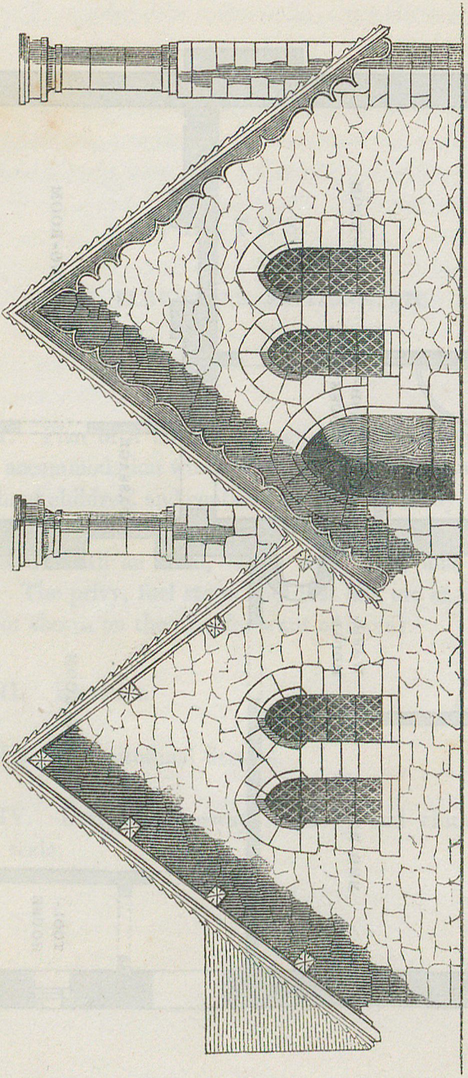


Plate II.

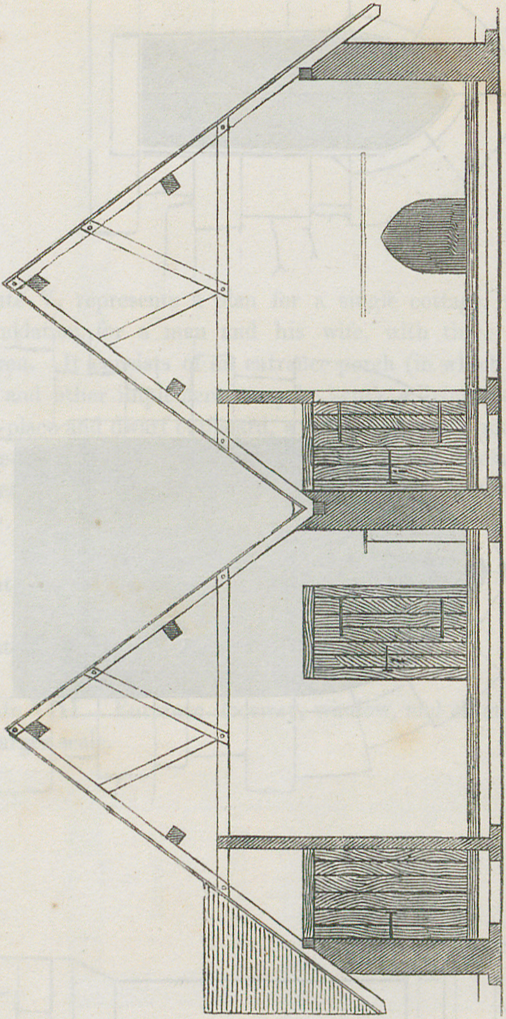


Plate III.

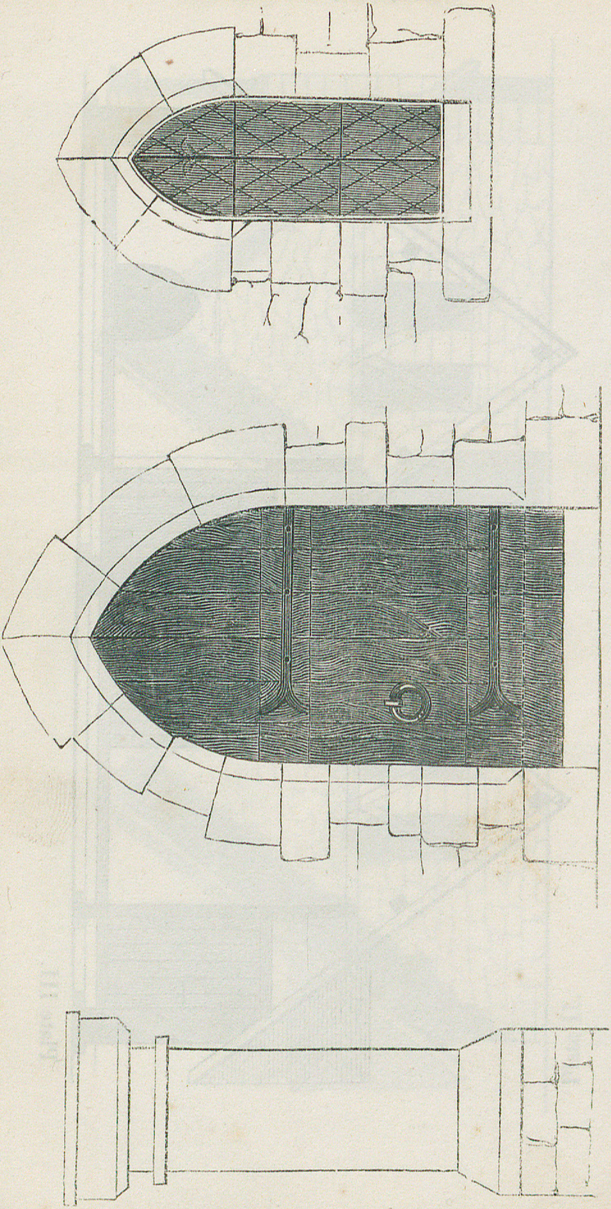


Plate IV.

Plate V. represents a plan for a single cottage, with accommodation for a man and his wife, with three or four children. It consists of an entrance porch (in which agricultural and other implements may be kept), a living-room with a fire-place and dwarf cupboard, a kitchen or wash-house with a fire-place, oven, sink, safe for food, and a dresser with shelves above, two bed-rooms, a privy, and a dust and fuel house.

Plate VI. Elevation.

Plate VII. Longitudinal Section.

Plate VIII. Entrance doorway, window, and chimney-pot, to a larger scale.

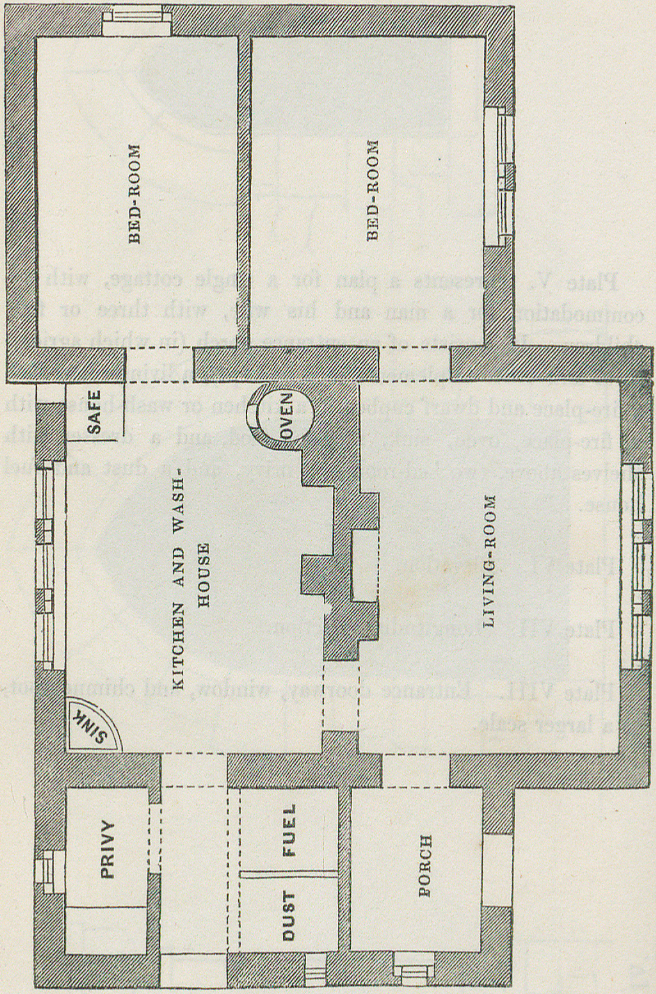

BED-ROOM
BED-ROOM
SAFE
OVEN
KITCHEN AND WASH-HOUSE
LIVING-ROOM
SINK
PRIVY
FUEL
DUST
PORCH

Plate V.

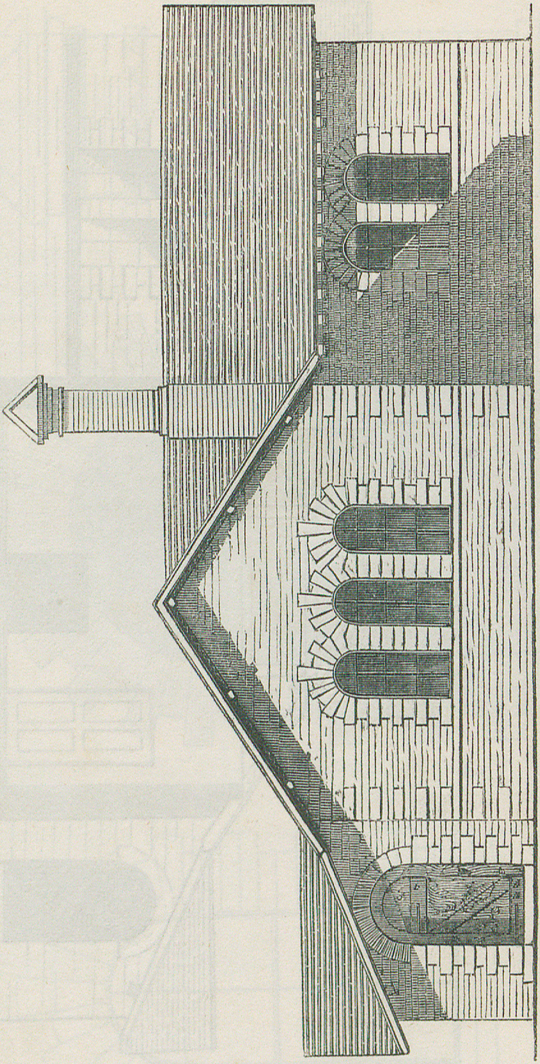


Plate VI.

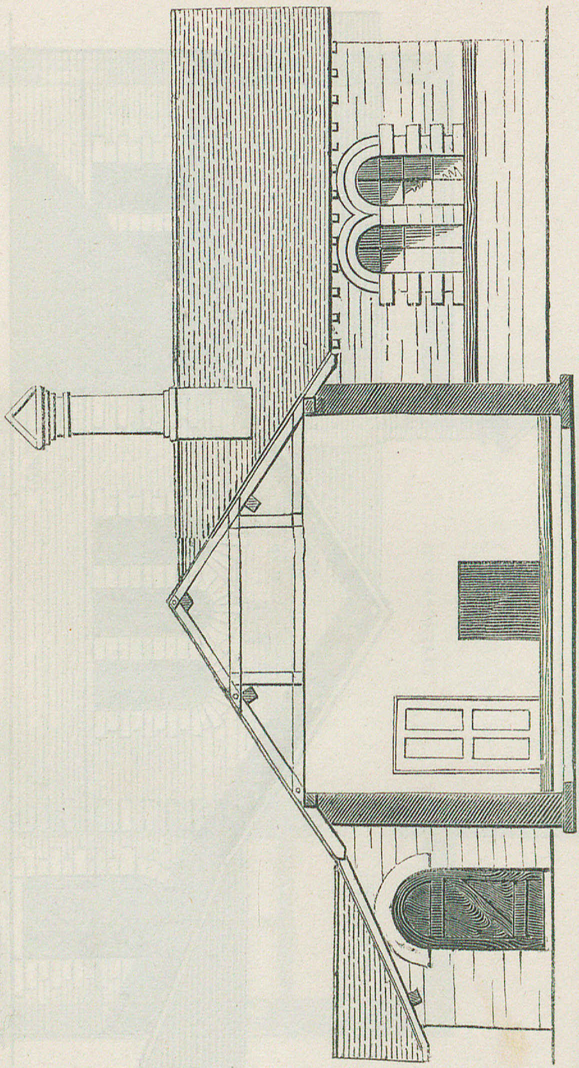


Plate VII.

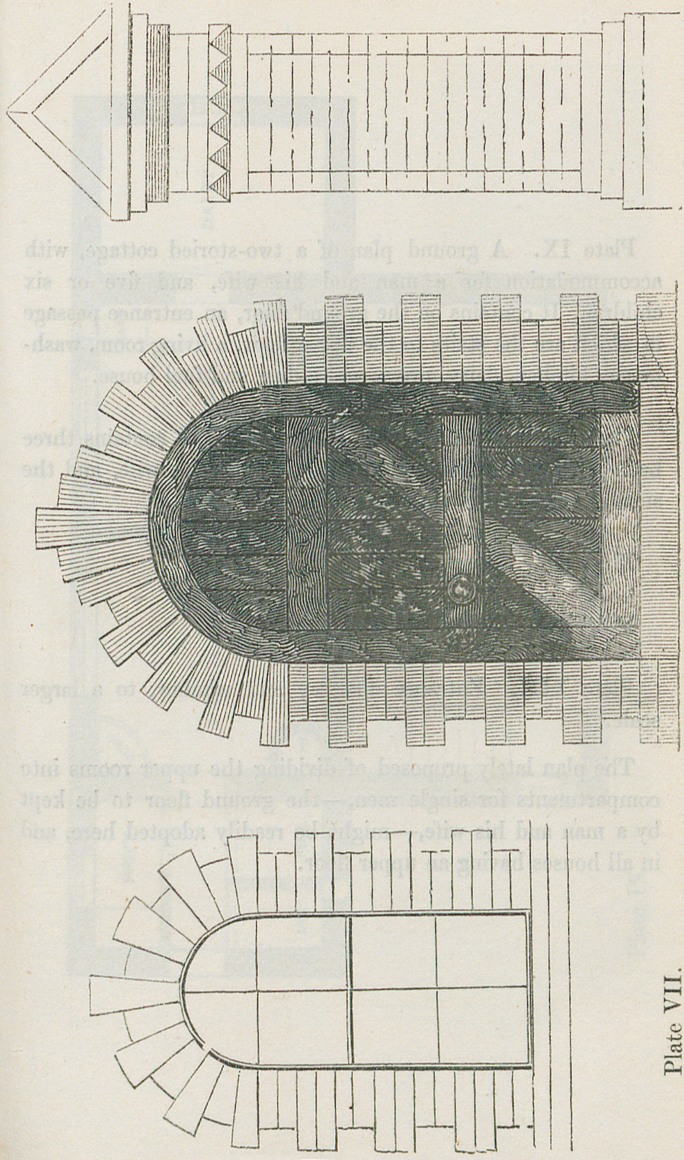


Plate VII.

Plate IX. A ground plan of a two-storied cottage, with accommodation for a man and his wife, and five or six children. It contains on the ground floor, an entrance passage in which are the stairs to the upper floor, a living room, wash-house, kitchen, dairy, privy, and a dust and fuel house.

Plate X. is a plan of the upper story, and contains three bed-rooms, the larger one for the man and his wife, and the smaller ones for the boys and girls.

Plate XI. Elevation.

Plate XII. Longitudinal Section.

Plate XIII. Entrance doorway and window, to a larger scale.

The plan lately proposed of dividing the upper rooms into compartments for single men,—the ground floor to be kept by a man and his wife,—might be readily adopted here, and in all houses having an upper floor.

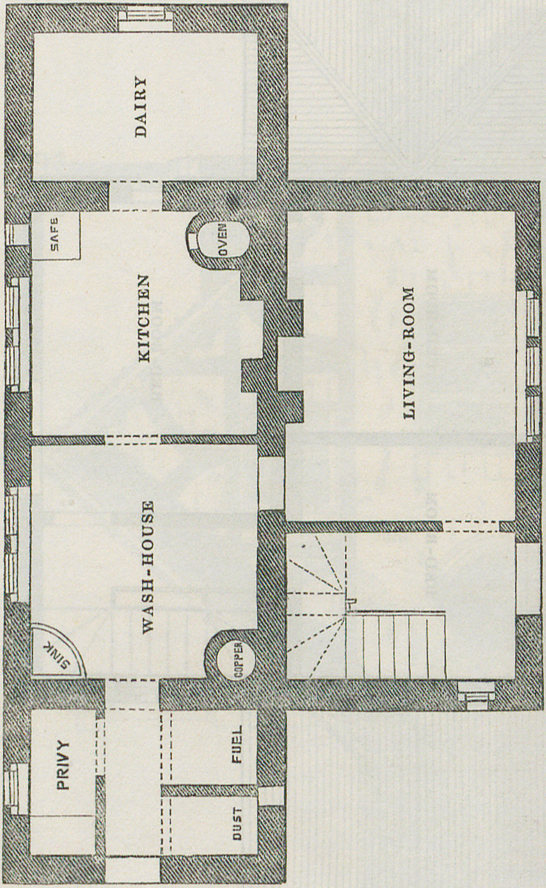

DAIRY
SAFE
OVEN
KITCHEN
LIVING-ROOM
WASH-HOUSE
SINK
COPPER
PRIVY
FUEL
DUST

Plate IX.

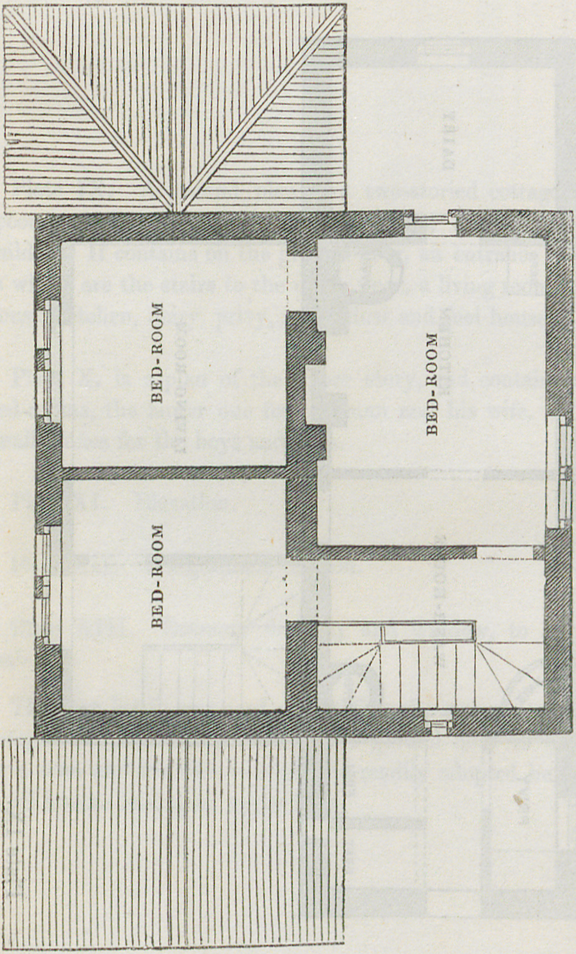


Plate X.

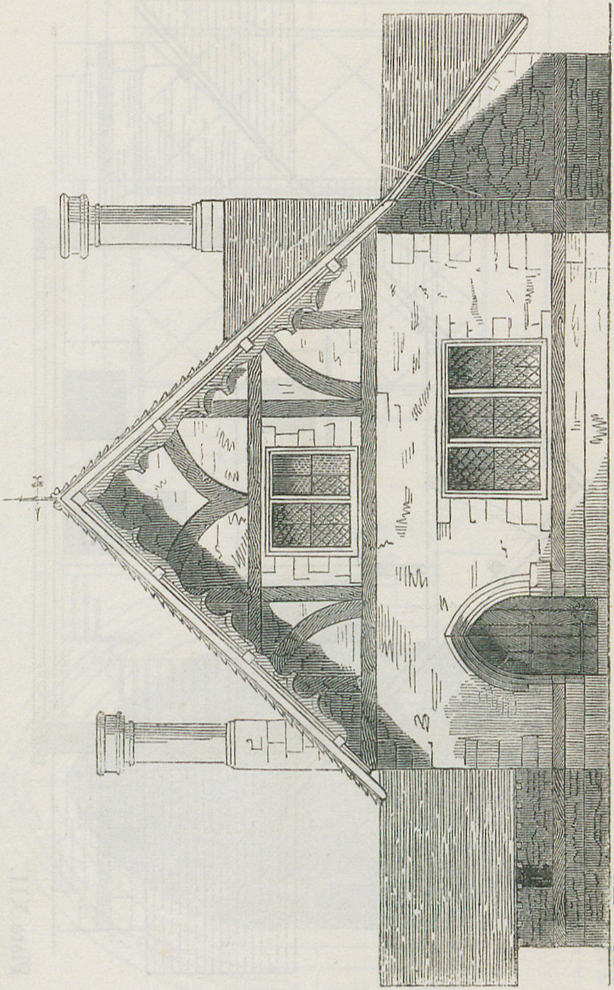


Plate XI.

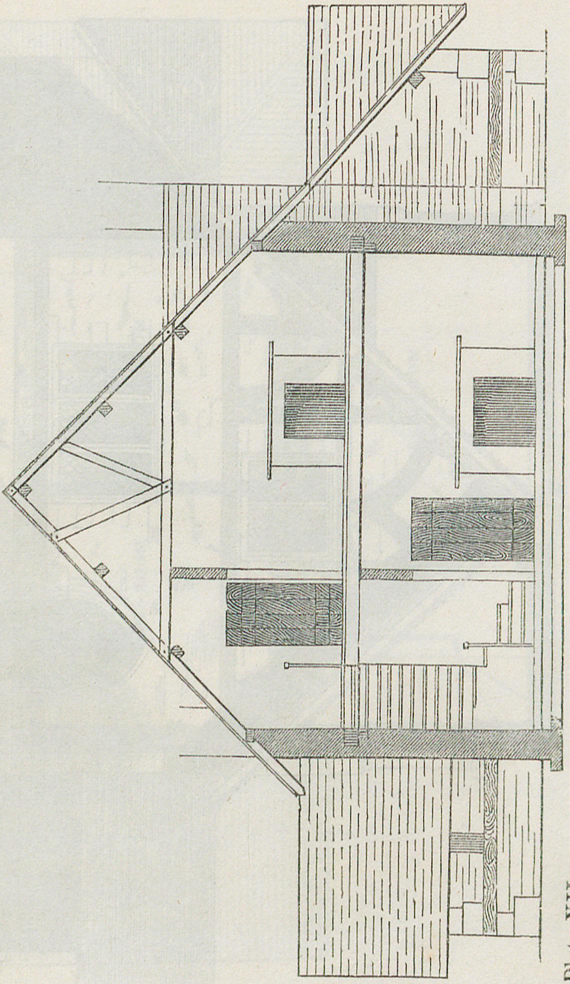


Plate XII.

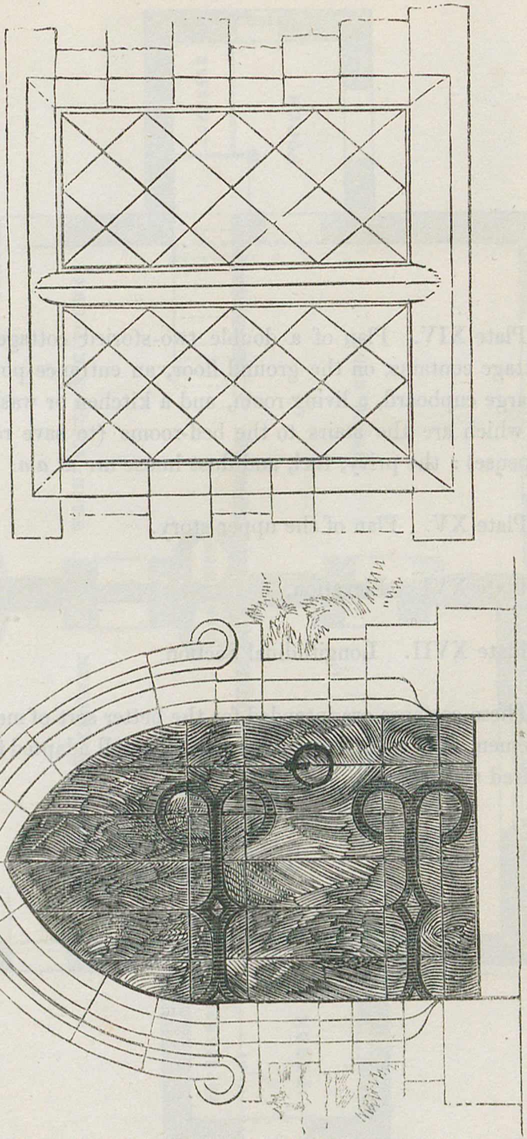


Plate XIII.

Plate XIV. Plan of a double two-storied cottage. Each cottage contains, on the ground floor, an entrance-porch with a large cupboard, a living-room, and a kitchen or wash-house, in which are the stairs to the bed-rooms (to save room and expense): the privy, fuel, and dust house are at *a a*.

Plate XV. Plan of the upper story.

Plate XVI. Elevation.

Plate XVII. Longitudinal Section.

These cottages are intended for the better sort of mechanics, foremen, farm bailiffs, &c., and would be well adapted for small retired tradesmen.

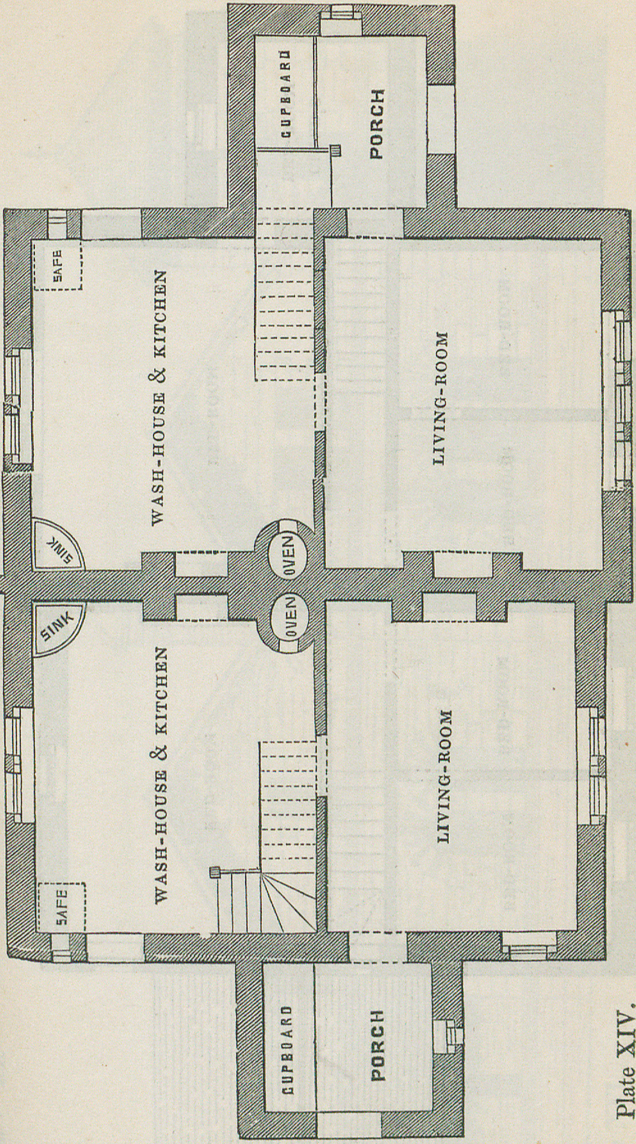

CUPBOARD
PORCH
SAFE
WASH-HOUSE & KITCHEN
LIVING-ROOM
SINK
OVEN
OVEN
SINK
WASH-HOUSE & KITCHEN
LIVING-ROOM
SAFE
CUPBOARD
PORCH

Plate XIV.

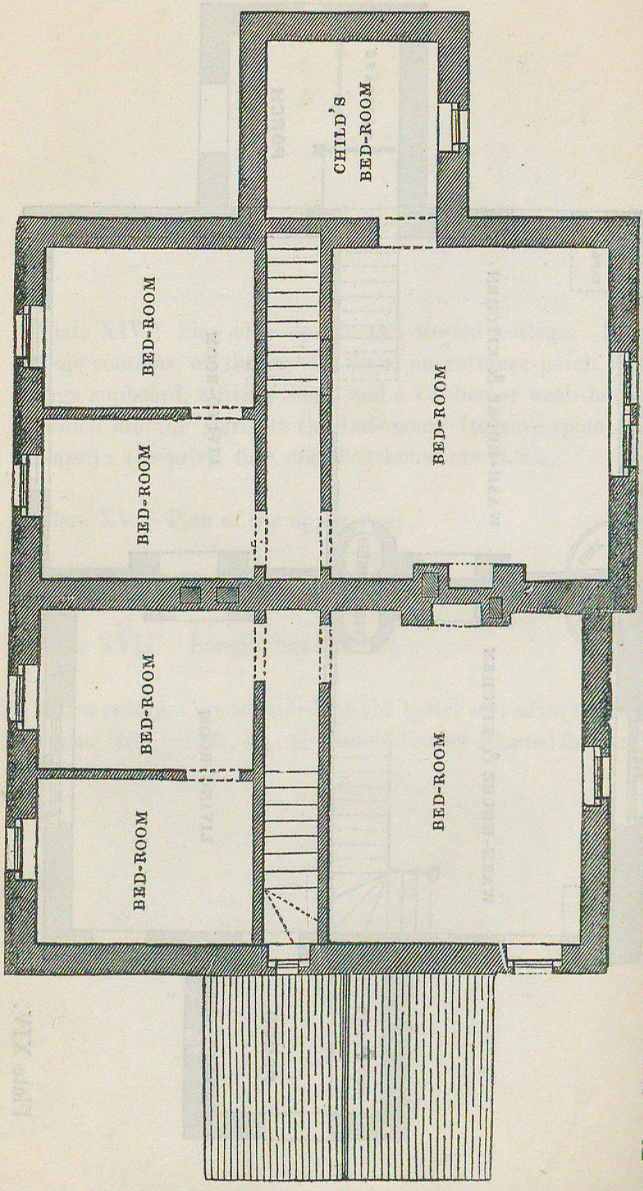

CHILD'S
BED-ROOM
BED-ROOM
BED-ROOM
BED-ROOM
BED-ROOM
BED-ROOM
BED-ROOM

Plate XV.

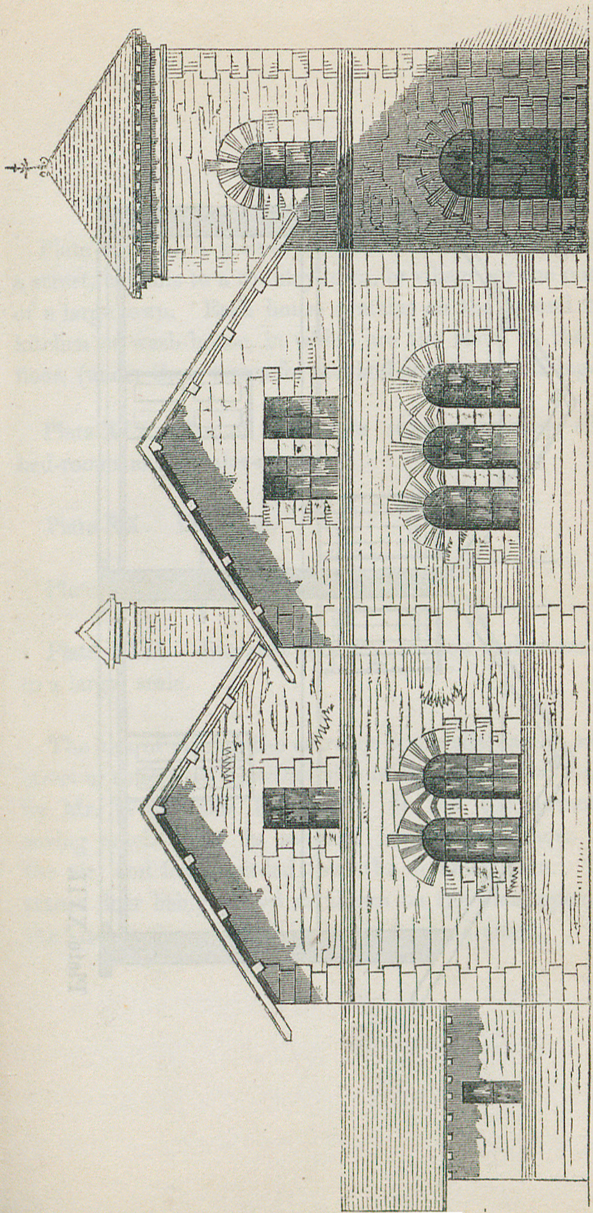


Plate XVI.

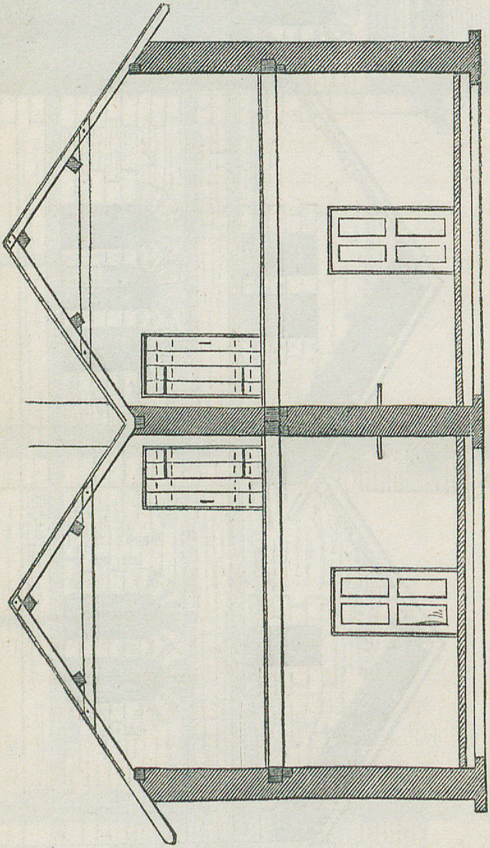


Plate XVII.

Plate XVIII. A ground plan of two houses forming part of a street, suitable to a country town, or village, or the outskirts of a large town. Each house contains on the ground floor, a kitchen or wash-house, in which are the stairs to the upper floor, (under them boxes for fuel and dust,) and a living-room.

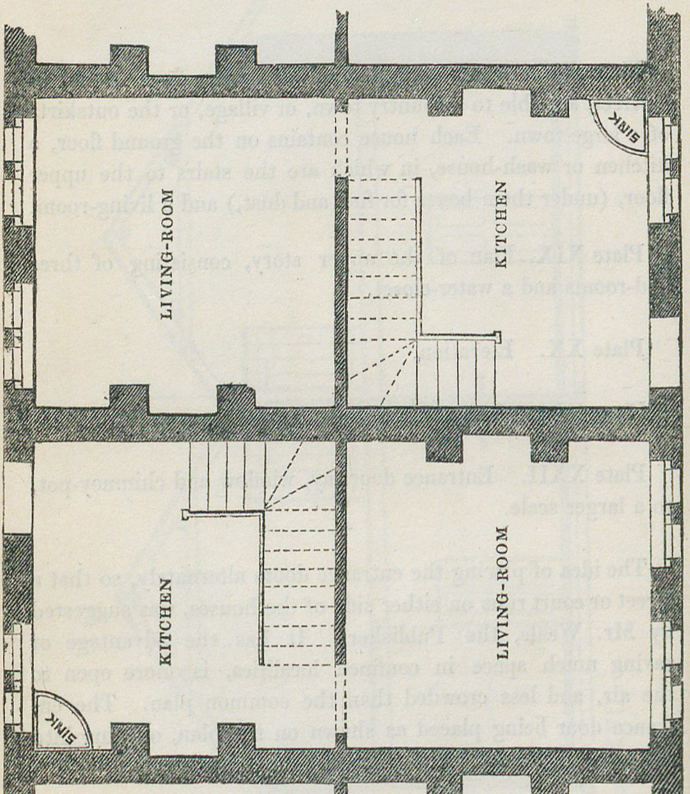
Plate XIX. Plan of the upper story, consisting of three bed-rooms and a water-closet.

Plate XX. Elevation.

Plate XXI. Longitudinal Section.

Plate XXII. Entrance doorway, window and chimney-pot, to a larger scale.

The idea of placing the entrance doors alternately, so that a street or court runs on either side of the houses, was suggested by Mr. Weale, the Publisher. It has the advantage of saving much space in confined localities, is more open to the air, and less crowded than the common plan. The entrance door being placed as shown on the plan, opening into the kitchen, leaves the living-room free and quiet.


LIVING-ROOM
KITCHEN
SINK
KITCHEN
LIVING-ROOM
SINK

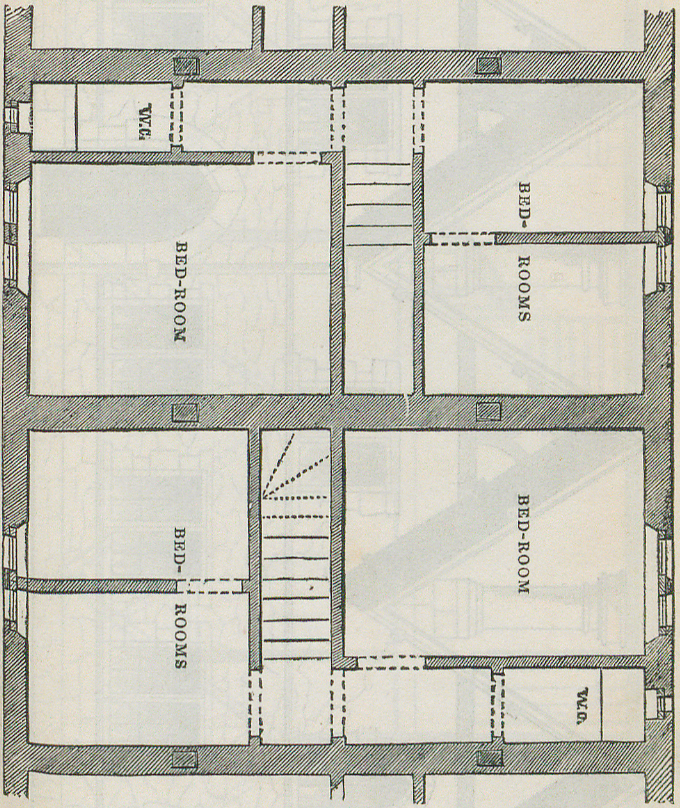


Plate XIX.

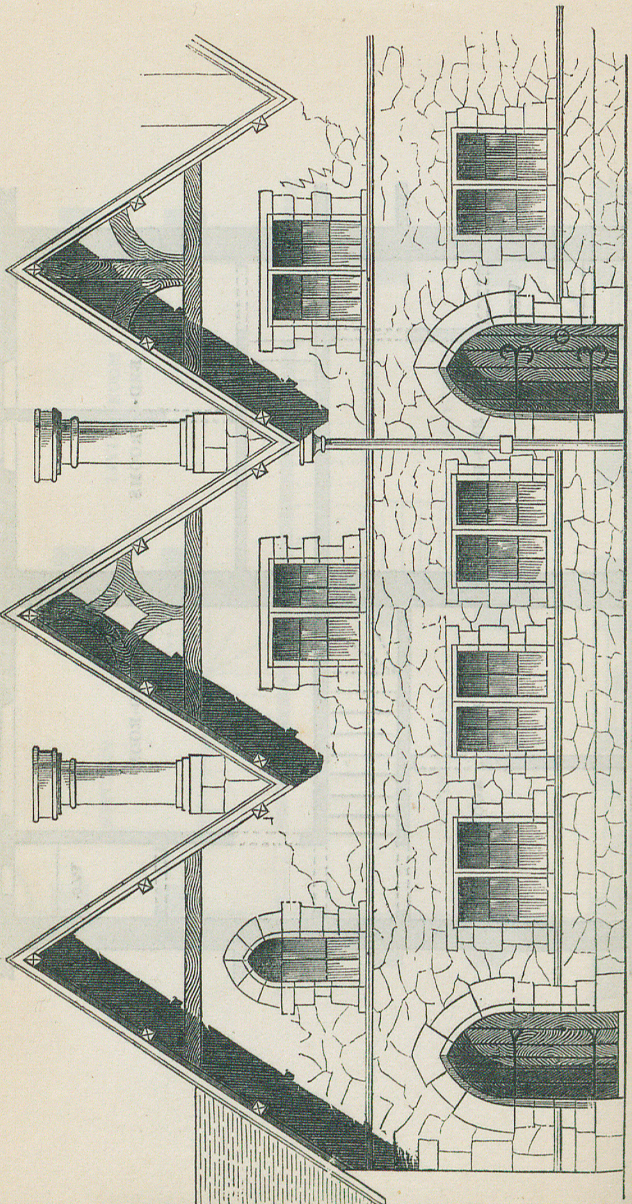


Plate XX.

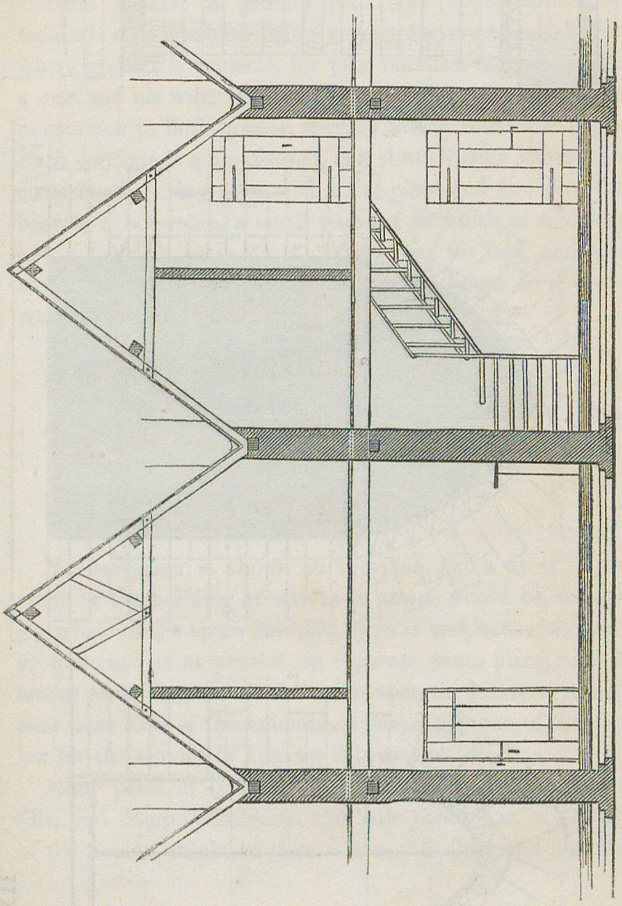


Plate XXI.

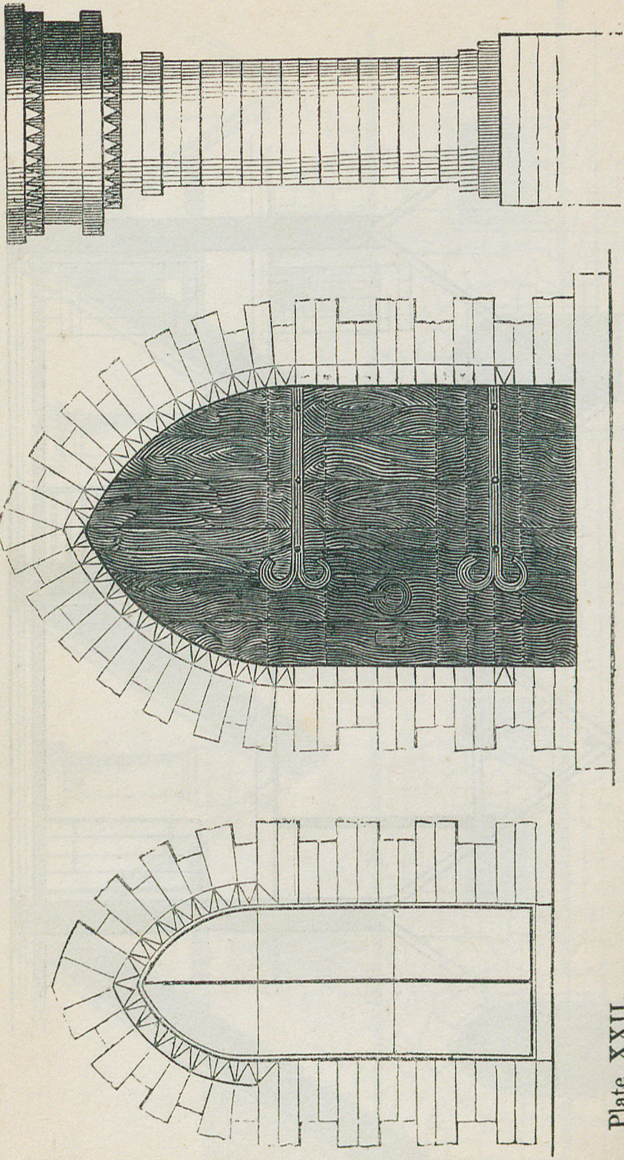


Plate XXII.

Plate XXIII. A ground plan (the upper stories being similar) of a double-lodging house, for towns and localities where ground is valuable, for poor families, each consisting of a man and his wife, with one or two children. The staircase is common to both houses, thereby saving room and expense. Each domicile is quite distinct, and shut off from the rest; and consists of a living-room with a fire-place and two dwarf cupboards, a bed-room, a small passage, in which is a sink, and out of which a water-closet, a large box for fuel, and a dust shaft, from the uppermost story of the house to a common receptacle in the basement.

Plate XXIV. Street Elevation.

Plate XXV. Elevation for a smaller house.

Plate XXVI. Transverse Section.

No back-door is shown on the plan, and a great improvement in the building of streets in towns would be, to lay out the whole of the space enclosed by rows and houses as garden-ground (not as at present, in separate damp plots), and with one or more common entrances between the houses. A trifling sum from each of the inhabitants would pay one of their number for the trouble of keeping it in order.

Many parts of London, at present so unhealthy, from the filth and damp collected in the little yards, &c., at the backs of the houses, might be thus rendered healthy and cheerful.

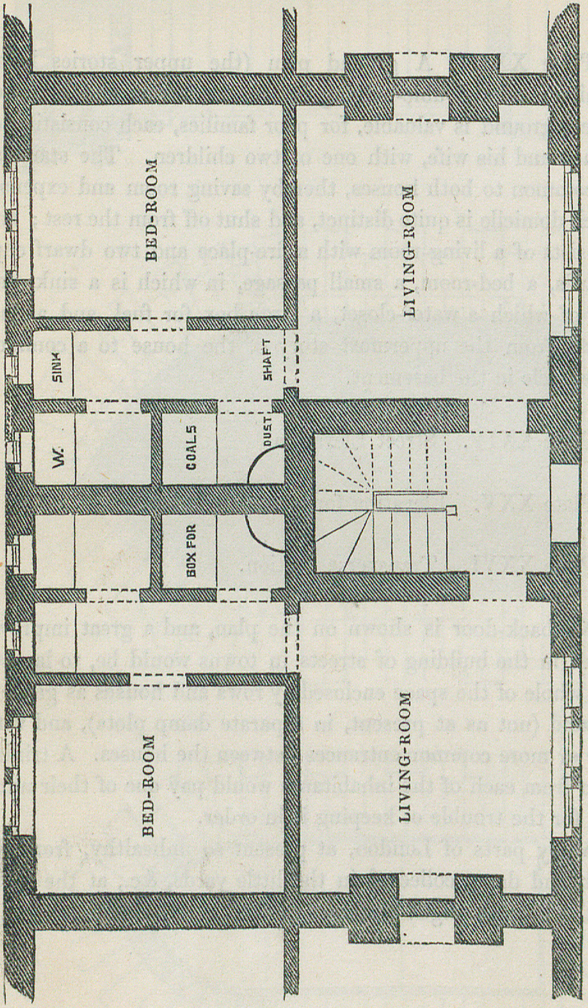

BED-ROOM
LIVING-ROOM
SINK
SHAFT
W.
COALS
DUST
BOX FOR
BED-ROOM
LIVING-ROOM

Plate XXIII.

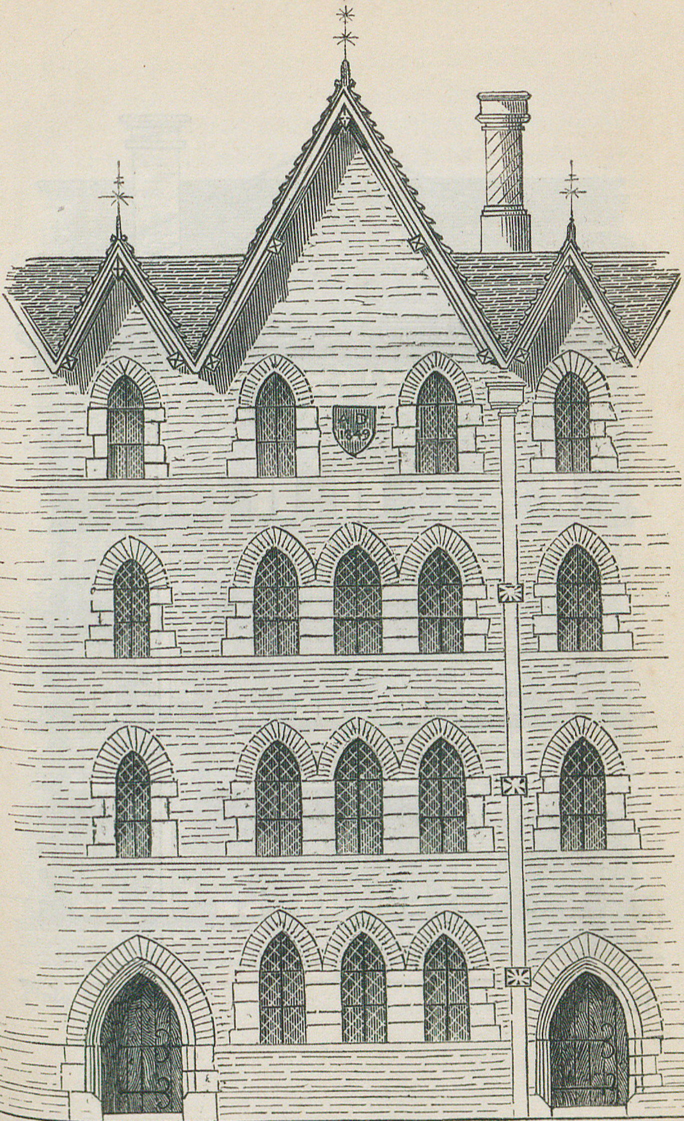


Plate XXIV.

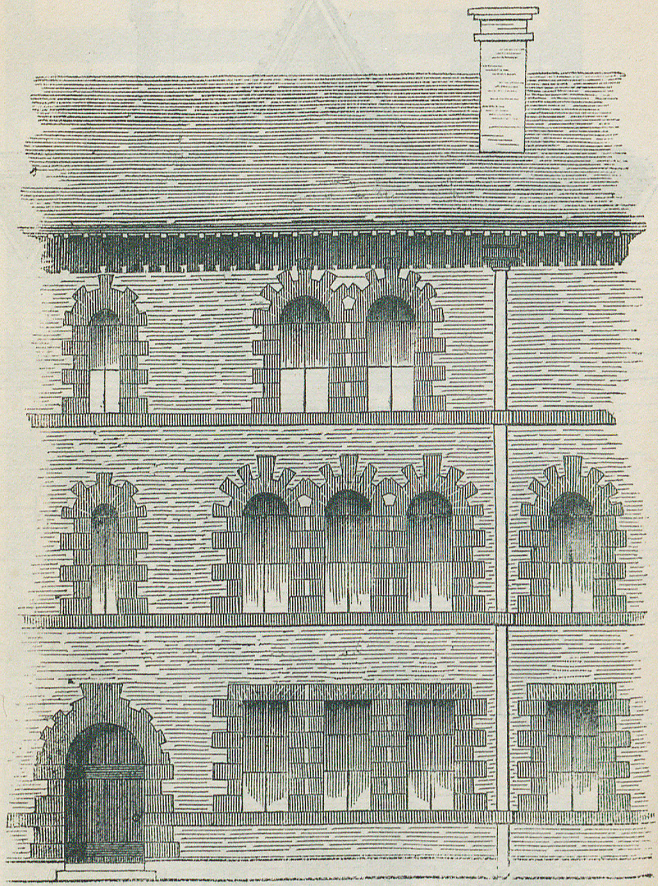


Plate XXV.

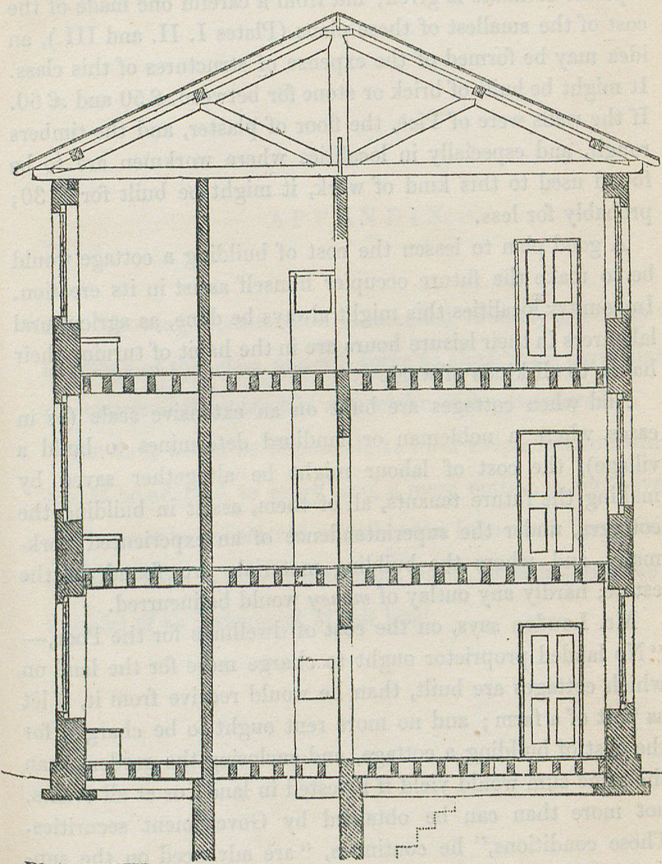


Plate XXVI.

ESTIMATE OF COST.

As the cost of a building varies so greatly in different localities, according to the price of materials and labour, no separate estimate is given; but from a careful one made of the cost of the smallest of these plans (Plates I. II. and III.), an idea may be formed of the expense of structures of this class. It might be built of brick or stone for between £50 and £60. If the walls were of Pisè, the floor of plaster, and the timbers rough, and especially in localities where workmen are to be found used to this kind of work, it might be built for £30; probably for less.

A good plan to lessen the cost of building a cottage would be to make the future occupier himself assist in its erection. In country localities this might always be done, as agricultural labourers in their leisure hours are in the habit of turning their hands to all kinds of work.

And when cottages are built on an extensive scale (as in cases where a nobleman or landlord determines to build a village), the cost of labour might be altogether saved by making the future tenants, all of them, assist in building the cottages, under the superintendence of an experienced workman; and where the building materials are found on the estate, hardly any outlay of *money* would be incurred.

Mr. Loudon says, on the cost of dwellings for the Poor,—"No landed proprietor ought to charge more for the land on which cottages are built, than he would receive from it, if let as part of a farm; and no more rent ought to be charged for the cost of building a cottage, and enclosing the garden, than the same sum would yield if invested in land; or at all events, not more than can be obtained by Government securities. These conditions," he continues, "are advanced on the supposition that the builder is actuated as much by feelings of human sympathy as by a desire to make money, and hence they are addressed to the wealthy, and especially to the proprietors of land and extensive manufactories or mines."

APPENDIX.

The following Specification is intended to apply generally to buildings of this class, and will serve to show more particularly the nature of the materials and workmanship employed.

But as it would be impossible to form a Specification which should be adapted to every case, a mere outline is here given, and it must be considered as rather the framework upon which a Specification is to be constructed, suited to each case, than as a model of an instrument of this kind.

SPECIFICATION

OF

WORKS TO BE DONE IN THE ERECTION OF COTTAGES.

Excavator— The ground is to be excavated for the construction of the foundations, drains, cesspools, and all the other works for which the ground may require to be excavated; and to fill in again, and level, the ground about the foundation and other works.

To remove and cart away all the earth and rubbish, and to leave the house and ground perfectly clear at the conclusion of the works.

Bricklayer— The walls are to be executed with sound, hard, and well-burnt . . bricks, laid in mortar. The mortar to be compounded of one-third, by measure, of well-burnt stone lime, and two-thirds of clean sharp sand, free from salt, both to be well beaten and worked up together.

To lay the whole of the brickwork in English bond; the exterior to be worked fair and finished with a neat flat-ruled joint; the interior to be worked fair for colouring, or left rough for plastering. It is to be well bedded and flushed in with mortar, and no four courses to exceed . . inches in height.

To construct for soil-drainage, a barrel drain, . . inches bore; from . . to . . in . . inch brickwork, stuccoed on the lower-half of inside with cement,—or, the drain to be constructed of glazed earthenware pipes, jointed in cement.

To construct a cesspool . . feet in diameter and . . feet deep, to be steined round with

Bricklayer——. . inch brickwork, and covered with a Yorkshire stone cover.

To construct the rain-water drains from . . to . . of . . inch glazed earthenware pipe, jointed in cement.

To construct a rain-water tank . . feet diameter and . . feet deep, of . . inch brickwork in cement, to be covered with a Yorkshire stone cover.

To put a course of slates between two beds of cement throughout the walls at the level of the ground surface, to prevent the rising of the damp.

To put to all openings in the brickwork plain arches closely set, to be finished externally with a neat flat-ruled joint.

To build up, core, and parget the chimney-flues.

To put to each fire-place a . . inch brick trimmer, and a chimney-bar of wrought iron.

To thoroughly bed in mortar all the wall-plates, wood-bricks, lintels, bond-timber, and other work requiring to be set in brickwork, and to bed in and point round with lime and hair mortar all the door and window frames.

To properly set with fire-bricks the grates and copper.

To construct an oven with rounded bricks, domed over and cased inside with fire-bricks; and to fix an iron-plate door, and carry up a proper flue.

To pave the . . with hard, sound, well-burnt . . bricks laid on edge in mortar, upon dry rubbish.

To pave the . . with . . inch paving-tiles laid angle-wise in mortar, upon dry rubbish.

Mason———— To put to the external doorways Yorkshire stone solid tooled steps, with mortise-holes for receiving the ends of the door-posts; and to provide and fix a wrought-iron shoe-scraper.

To put to all the windows . . stone sills, properly sunk and weathered.

To put to each fire-place a hearth and back-

Mason ——— hearth of . . inch Yorkshire stone, and a stone curb round the hearth, as a fender, . . inches high × . . inches thick, chamfered on the outer side.

To put to the fire-places of the living-room and kitchen a . . shelf . . inches wide, . . feet in length.

To provide and fix in the kitchen a Yorkshire stone sink, . . inches thick, with a hole cut to receive the waste-pipe.

To cut in the stonework all necessary holes, mortises, rebates, and grooves, as required.

Slater ——— To cover the roof with good stout . . slate, securely fixed with zinc nails, two to each slate. Every part of the slating is to be properly bonded, the eaves to be laid double, and the ridge covered with black ridge-tiles.

The under side of the slates is to be pointed with lime and hair mortar.

To fillet the slating, wherever requisite, against the brickwork, with cement, strong iron nails being driven in to secure it.

Or, To cover the roof with good plain tiles, laid to a proper gauge in lime and hair mortar; each tile to be secured by an oak peg. The ridge to be covered with proper ridge-tiles, secured by T-nails.

Carpenter ——— All the oak timber to be . . ; all the other timber to be . . , or . . , and the deals to be . . The timber and deals are to be entirely free from sap, shakes, large loose and dead knots, and every other defect.

All the timbers are to measure the full scantlings shown on the drawings; no joists, ceiling joists, quarters or rafters, are to be more than . . inches apart.

To put wood-bricks, where necessary, for fixing the joiners' work.

To put lintels where requisite.

To construct the ground floor joists of . . inches × . . inches, on plates . . inches × . . inches.

Carpenter—— The joists of upper floor to be . . inches × . . inches, on wall-plates . . inches × . . inches. Trimmer and trimming-joists to be $\frac{1}{2}$ inch thicker.

To frame quarter partitions of . . heads and sills . . inches × . . inches; door-posts, side-posts, plates above doors, and braces, . . inches × . . inches; quarters, . . inches × . . inches.

To construct the roof of timbers and wood-work of the following scantlings and sizes:

Wall-plates . . inches × . . inches; purlins . . inches × . . inches; collar-beam . . inches × . . inches; rafters . . inches × . . inches; ceiling-joists . . inches × . . inches; ridge-piece . . inches × . . inches; slate battens . . inches × . . inch.

Roof over lean-too:

Wall-plates . . inches × . . inches; rafters . . inches × . . inches; slate battens . . 2 inches × . . inch.

Joiner——— To construct the floors of . . of . . inch . . deal; wrought and laid folding,—or, straight joint.

To fix a . . inch deal skirting . . inches high, in . . .

To construct the stairs (if the cottage have an upper floor) of . . inch deal treads, with splayed nosings, framed into . . inch string bearers, with newel, and balusters, one on each step, and splayed hand-rail.

To put to the external doorway, proper fir door-cases . . inches × . . inches, with the door-posts tenoned into the door-step.

To put to the front doorway a . . inch deal square and bead-but six-panel door, to be hung with strong wrought-iron hinges, one . . inch barrel bolt, and a good . . inch iron-rimmed lock.

Or, To put to the front doorway a . . inch deal door, formed with vertical ledges, rebated and beaded joints nailed to back braces,

Joiner——— . . inches × . . inch, to be hung with strong wrought-iron hinges, one . . inch barrel bolt, and a good . . inch iron-rimmed lock.

The back door to have in addition a Norfolk thumb-latch.

The doors of out-buildings to be of . . inch deal.

To fit up all the internal doorways with four-panel . . inch square-framed doors, with . . inch deal panels, hung with wrought-iron hinges, good . . inch iron-rimmed locks, and stout Norfolk thumb-latches; . . inch single rebated linings: or, hung to . . inch jambs and heads, having a bead on both sides to cover the plaster joints.

To fit to the window-openings deal-cased frames with oak sunk sills; to have . . inch sashes double hung, with iron weights, iron axle-pulleys, lines, and fastenings.

Or, to fit to the window-openings, solid fir, wrought, rebated, and beaded frames, with oak sunk sills, which are to have . . inch deal casements filled in with cross bars, hung with but-hinges, and provided with proper fastenings.

To fix to the inside of window-openings . . inch deal window-boards, jambs, and soffits.

To put in the recesses of the fire-places in . . dwarf closets, with . . inch tops, on proper bearers, . . inch deal fronts, and . . inch deal square-framed door, hung with . . inch but-hinges, and to have . . inch good closet locks; and to put to each of the closets a shelf of . . inch deal.

To fix in the kitchen a dresser . . feet long . . feet wide, of . . inch clean deal, with two drawers of . . inch deal fronts and . . inch deal dovetailed rims and bottoms, strong legs and bearers, . . inch deal foot-board, and above,—three . . inch deal shelves.

The privy to have a seat of . . inch deal, with deal riser and cover.

Plasterer—— To lath, plaster, set, and whiten; the ceilings and partitions in . .

To render and set the walls of . .; the same to be coloured twice with a good stone colour,—or, prepared for paper.

The privies are to be lime-whited inside.

Smith—— To provide and fix a . . inch cast-iron guttering to the eaves throughout, to be securely fixed to wrought-iron brackets.

To fix cast-iron rain-water pipes . . inches square, with heads, and shoes delivering into drains.

To provide and fix in the kitchen fire-place a grate, having a . . inch oven and . . boiler.

The other fire-places to have . . grates.

To provide and fix a copper in scullery.

To provide and fix a bar to each window on ground story.

To provide and fix cast-iron air-gratings in the external walls, where directed.

To provide and fix casements of wrought iron.

To provide all other requisite iron-work.

Plumber—— To lay the valleys of roofs with milled lead . . ℔s. to the foot,—or, . . .

To provide and fix a pipe to conduct water into the cistern from the town or other supply, and a pipe from the cistern to sink, with brass cock.

Or, To provide and fix an iron pump, with pipe to rain-water tank.

To put from the sink to the drain a strong lead waste-pipe, with a large bell-trap.

Painter—— To properly prepare and paint the whole of the wood and iron work four times with good and proper oil colour.

Or, To stain and twice varnish all the woodwork.

Glazier—— To glaze the windows with good second

Glazier——Newcastle glass, properly bedded, and back-puttied.

Paper-hanger— To prepare properly and hang the whole of the plastered sides of the . . rooms with paper at . . per yard.

Yards, gardens, and External walls. Properly form and level the surface of the yards or gardens.

The enclosure-walls of gardens to be . . inches thick and . . feet high, and to be formed of . . .

The whole of the works are to be executed and finished in a good and workmanlike manner, according to this Specification, and with the materials and workmanship described therein, and according to the drawings of plans, sections, elevations, and details, all of which are to be strictly attended to, as to form, dimensions, and all other particulars therein shown.

No extra works are to be charged for, but such as are agreed upon at the time, and an order in writing given to the contractor.

THE END.

Hughes & Robinson, Printers, King's Head Court, Gough Square.

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